Title: Use of cognitive measurement tools in prediction of psychological wellbeing

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Abstract

Prediction of psychological wellbeing was investigated utilising a specific set of cognitive measures. This study considered a mixed method approach, progressing in three main phases. First study (the pilot study) involved (n=147) participants where data analysis was conducted using ANOVA, multiple regression and Structural Equation Modelling (SEM). The Pilot study considered six measures of thinking Style or Dysfunctional Attitude Scale (DAS-24), Attributional Style Questionnaire (ASQ-6 negative), Meta-cognitive Awareness Questionnaire (MAQ), Mastery/control, Cybernetic Coping Scale (CCS-15) and Beck Depression Inventory BDI-II. The correlation analysis showed positive association between variables with predictive approximation of 30% for depressive symptoms. The pilot study's confirmatory factor and path analysis results produced supporting evidence of predictive quality with a good fit with model.

The second phase comprised of a two-wave panel survey which included most of the measures from study one but added a 12-item version of Eysenck's Personality Inventory, while the Patient Health Questionnaire (PHQ-9) and General Anxiety Disorder (GAD-7) measures replaced the BDI-II. Regression analysis indicated that approximately 50% of the variance in PHQ scores could be predicted with DAS-24, mastery, ASQ and Neuroticism being the strongest predictors. A second regression analysis predicted 65% of the variance in GAD7 scores with DAS success and perfectionism sub factor being the strongest predictor. A series of confirmatory factor analysis was conducted as well as regression and covariance analysis of the identified variables.

Longitudinal path analyses were performed indicating that approximately 74% of the variance in PHQ9 scores and 71% of the variance in GAD7 scores at time two could be predicted, with the time one well-being measures the strongest predictors. The most striking findings related to the role of Neuroticism in prediction of psychological wellbeing.

Third phase of this mixed method study considered qualitative approach, using framework analysis. Participants were twelve clinicians who currently working with clients with depressive or anxiety based difficulties. The main findings indicated that all previously identified independent variables of thinking style, perception, control and though awareness contributing towards psychological wellbeing. Other notable observation included participant's clinical training modality that influenced the choice of responses.

Overall tested hypotheses in both modalities of studies provided additional knowledge and understanding by offering a unique theoretical perspective, where the correlation between psychological wellbeing and cognitive processes could be predicted when utilising specific sets of measures.

Acknowledgments

The author wishes to offer a special thank and express my sincere gratitude to my advisor Prof. Andy Guppy for the continuous support of my Ph.D. study and related research, for his patience, motivation, and immense knowledge. His guidance helped me a great deal. I could not have imagined having a better advisor and mentor for my Ph.D. study. My sincere thanks and gratitude also go to Dr. Hossein Kaviani who also supported, advised, encouraged and guided me throughout this journey. Also author wish to thank Dr. Stephen Gregson for his support and patience in reviewing this thesis.

Finally, a special thank goes to my immediate family for their constant source of support and patience, times missed being with them. The Author wishes to express his gratitude to my extended family members and colleagues who aided and encouraged me throughout this endeavour.

Declaration

I declare that this thesis is my own unaided work. It is being submitted for a *Ph.D.* at the University of Bedfordshire.

It has not been submitted before for any degree or examination in any other University.

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Date: 24/02/2016

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Preface

A significant amount of research has been undertaken on psychological wellbeing, some of which has explored the link between cognitive measures and psychological state. Meanwhile a small number of researchers (Segal, Williams and Teasdale, 2013) have considered and examined cognitive measures in offering predictive qualities for assessment of psychological wellbeing. The aim of the research in this thesis is to address the shortfalls within the existing literature by combining selected measures in order both to enable a better understanding of psychological state and to provide a more comprehensive predictor of psychological wellbeing.

In recent years, there has been an increasing recognition of the impact and importance of mental health, stress and its associated conditions by individuals and organizations. In part this greater recognition is a response to the demand from the wider population for treatment of psychological wellbeing that has been developed, tested and applied through rigorous research. Use of cognitive measures, however, has been predominantly utilized in psychological treatment following a diagnosis of symptom or condition, rather than being utilized as a preventative measure. Similarly, the model of stress (Seyle, 1976) has highlighted and recognized the process and its impact. Current evidence-based research has pursued the same strategies in identifying the link between stress, mental health and psychological wellbeing. In the process, it is noteworthy that consideration in preventive measures has been in shortcoming. It is appropriate, therefore, to examine the evidence in order to offer a primary course of action instead of seeking active treatment through research and practice. The debate about current interventions is not the topic of this thesis, but it is anticipated that, by considering a new theoretical explanation, a more appropriate method of theoretical position with reference to psychological wellbeing may be initiated. It is also potentially viable to consider that future interventions could be modified accordingly. In the first chapter, a theoretical explanation will be given that will include a definition of psychological wellbeing, mental health and the model of stress along with associated theoretical descriptions in which the contemporary view of the model of stress and its relationship with psychological wellbeing will be discussed and examined. The debate on cognition and emotion will be reviewed by reflecting on the background to, and current developments of, cognition and emotion and their role in currently adapted therapeutic approaches.

Individual differences along with dispositional characteristics of personality, negative affectivity, mastery and coping will be presented at a later stage of the chapter. This chapter will also provide a cogent explanation for the use of specific sets of measures in line with theoretical points of view, therefore providing a clear rational for their use within the study. The purpose of the study will be summarized in the light of reflecting on previous discussions.

An overview of theoretical understanding along with a decision on the constructs of measures utilized for the pilot study will be discussed in chapter two. This will be followed by the procedural, methodological and data analysis of the results from the first phase of study in chapter three. Having established and developed a grounded reasoning for theoretical points of view contingent on necessary adjustments to be made, chapter four will include the method and results of the first wave of the main phase of study, as well as an examination of the comparisons between previous segments of the collected and analysed data. The second and third wave of data sets will be also examined in this chapter, which a discussion on cross sectional results will be pursued in chapter five. Chapter six will explore the longitudinal analyses and the interpretation of the data sets. Thematic analysis and data analysis of clinical view will be discussed in chapter seven offering a supportive stance to the previously discussed hypothesis. Finally, in chapter eight, there will be a discussion on the research findings with a view to offering a theoretical explanation for the use of cognitive measures and concluding how the measures could be utilized in a novel approach in prediction of psychological wellbeing.

Chapter One

1.1 Overview of the theoretical concepts

Research into psychological wellbeing has been a longstanding interest of many researchers and clinicians alike. In its basic format, psychological wellbeing can be broken down into two paradigms: hedonic wellbeing or happiness that relates to study of positive psychology, and wellbeing or subjective wellbeing (Waterman, 1993; Ryan and Deci, 2001). In recent years the concept has been more distinguished in terms of subjective wellbeing and psychological wellbeing. It is also understood that psychological wellbeing of an individual is vital to their general daily function. Many researchers report the link between psychological wellbeing and active presence of symptoms of distress, while these symptoms can be presented in different forms such as anxiety, low mood or both. Regrettably, the current mode for approaching such difficulties mostly focuses on symptom presentation and, in turn, consideration for suitable and evidence-based psychological treatment. While the current evidence-based studies contribute towards the selection of the most suitable research in addressing the identified problem, the essence of individualised treatment also seems to have been misunderstood in spite of individualised formulations of the identified problem. Although priority is given to the individualised treatment of identified symptoms, it is noteworthy that the majority of approaches remain identical at their core. The main concern with this modality relates to the symptoms or conditions that show resistance to treatment, this is in spite of current interventions that existing research claims as suitable. This therefore highlights a shortfall in the understanding of the individualised subjective and psychological wellbeing of an individual. The lack of adequate provision and support has had a direct impact on individuals, organisations and wider society. It is likely that current methods of recognition and support, which focus on experienced symptoms rather than development of preventative strategies, are the only options in managing distress. This raises the question as to whether there is a better method for recognising psychological wellbeing that can facilitate adequate preventative measures prior to an evidence-based intervention. One of the hypotheses in this thesis to be put forward in this thesis will be concerned with the possibility of predicting psychological wellbeing.

This will be achieved by considering using sets of cognitive measures in order to identify factors and variables that contribute towards psychological wellbeing. This ought to enable individuals to become more aware of both their cognitive ability and cognitive risks, which in turn will help prevent the development of psychological distress. It is also postulated that the management and reduction in risk of further development of psychological distress can be intervened earlier. Or intervention becomes unnecessary if the individual concerned possesses a better understanding of their state of psychological wellbeing. To this extent, it is anticipated that this study will have a significant impact on individuals' quality of life, organisations and their direct influence on society.

This thesis begins with an outline and overview of the psychological wellbeing, health and mental health. The topic will then explore the influences and contributing factors towards the state of psychological wellbeing. Other concepts and models of wellbeing are presented such as Lambert et al (2015) who offer an overview of health and wellbeing, considering his reflection from previous studies by mapping am overlapping position. The discussion on these theoretical explanations, models and their impact has been commented and reported in order to draw a clearer attention and distinction on current study.

The concept of psychological wellbeing and its relational features will be primarily explained using the transactional models of stress introduced by Lazarus and Folkman, (1984). After a discussion on the models involved, there will be an analysis of these models' theoretical and practical application. This will be followed by a description of cognitive appraisals and the relationship between these appraisals. The link between appraisals and coping strategies will be reviewed including factors that may influence coping in relation to the levels of stress as well as the involvement and the impact of negative affectivity. Although the main discussion and theoretical comparisons will takes place in details in chapter two. Moreover, the discussion will examine the link between the dispositional factors as indicators of emotional outcomes and the direct or indirect correlations between these processes. These include appraisals, coping and its relationship to stress, control, negative affectivity and their association with emotional representations of depression and anxiety.

The relationship between the cognitive processes, coping and psychological wellbeing has been investigated previously, but considering and selecting the dispositional indicators of psychological wellbeing remains the target of much academic debate.

Although, stress has been highlighted as the main reported theme in this chapter and as such the theoretical position will be investigated, highlighting and reporting the associated models. The reported models described in this chapter and chapter two will provide a details accounts of theoretical frameworks, models that have been investigated within clinical and non clinical settings, all of which provide their own unique point of view. Though, there are overlapping features and contents within the context of wellbeing and stress, for example, appraisals and their roles as mediators of emotional responses and also similarly in individual's ability to cope with a given state of distress that has been described as transactional model of stress.

Rationale for considering discussion around the transactional model of stress was based on its association with the symptoms of anxiety and low mood. In addition contributory factors such as coping and control deemed to play a great part in management of stress. Previous studies in this area have taken into account a different stance with regards to factors that have a direct or indirect effect on the process of stress and individual's ability to cope. This discussion will be further elaborated in this chapter and chapter two where comparison and contrasts between these models will be presented. The description of the theory will be starting with the concept of health and wellbeing, leading to discussion around the factors that interplay in this process including emotional and cognitive responses, coping and control as well as personality traits. As such, this study is attempting to look at the relationship between these dispositional indicators and psychological wellbeing. Despite evidence to support the relationship between appraisals and emotional responses, many questions remain unanswered as to correlation and direct relationship between appraisals, coping and psychological wellbeing.

1.2 Introduction to the theoretical concepts of psychological wellbeing

The term psychological wellbeing is used interchangeably with general wellbeing in literature, portraying a global concept within a specific set of parameters. It is a simplified description of being, which relates to physical and emotional state. The links between these variables of psychological wellbeing are evident, while the processes by which the states of positive and negative wellbeing relates to each other seem theoretically explicable. Although some expositions are provided in order to explain the relational link, the relational processes and how the primal initial responses to a stimulus are decoded remain a point of debate. Furthermore, coping strategies (factors) utilised by an individual in managing faced difficulties with a specific state of distress remains predominantly inconclusive. This is partly due to the fact that other variables interplay, such as thinking style, perception, personality trait and mastery. There are a number of theories of psychological wellbeing that describe dimensions, features, components and their relationship with health and subjective psychological wellbeing; yet psychological wellbeing seems hard to define (Ryff and Keyes 1995; Cummins, 2010; Dodge et al. 2012). In this study the focus is on the term 'psychological wellbeing', which is used as the named variable to a state of health and wellbeing. Psychological wellbeing is defined as state of mental health and poignantly there is no specific definition for mental health either (Shives, 2005). Good mental health and psychological wellbeing could be considered as a positive state of mind when an individual is showing self-awareness, being self-directive, reasonably worry free and able to cope with his/her own daily tensions and difficulties. These difficulties may lead to a number of possible outcomes from distress to anxiety, depression or other psychological symptoms. The impact of depression and anxiety on individuals has been reported extensively by a number of researchers (Beck el al 1991; Wells, 1998; Williams et al. 2014). Furthermore, the relationship between anxiety and depression on society has been noted across all sectors at the level of both individuals and organisations (Beck, 1999). In response, the UK Government has recently articulated the case for greater investment in the treatment of those with emotional distress. This has led to a substantial investment by the Government in the treatment of anxiety and depression, which reportedly can affect approximately one in 10 people in the UK (DOH, 2007).

In a recent publication by office for national statistics, they reviewed 10 domains of wellbeing in United Kingdom (Evans, Mcrory and Randall, 2015) that initiated in 2010 for the first time. They indicated deterioration for anxiety and depression outcomes in three years follow up assessments. They also reported that 1 in 5 (18.3%) reported higher degree of anxiety and depression in 2013. A major attempt to address the shortfalls in this area of healthcare has been the introduction of the 'Improving Access to Psychological Therapies (IAPT) programme, which has been integrated as part of the overall current healthcare plan for England. Similarly research is ongoing in providing a more sustainable and suitable approach that could be readily accessible. This method of intervention intends to offer a preventative measure, at a primary level, which represents a protective and more proactive approach to psychological difficulties including symptoms of anxiety, depression and stress. The notion of prevention over treatment has been a longstanding aim of any theorist and clinician within the field of psychology. This chapter aims to provide a grounded explanation for concepts of health, subjective psychological wellbeing and mental health, alongside an examination of the relationship between the identified concepts and quality of life. Assessing the relationship between psychological wellbeing and cognitive processes, its sublevels and interaction between such variables will also be discussed further. In order to provide a rationale for the direction of study, the concept will focus on interrogating theoretical models of stress and cognition, as well as their relationship with subjective psychological wellbeing and how this is presented within a nonclinical population. This chapter will conclude with the presentation of the overarching rationale for this study.

1.2.1 Defining health and psychological wellbeing

Health may be described as a state of being when an individual is able to function well; for instance the World Health Organisation (WHO) has described health as 'a state of complete physical, mental and social being and not merely the absence of disease or infirmity' (WHO, 1946:100). As this definition infers, none of us is completely healthy, the main point could be that the individual is able to carry out their daily activities or daily function such as going to work or undertaking a routine task. It is also appropriate to examine that individual state of functionality that could be a marker for someone's state of health. This means that, in spite having some symptoms of ill health, an individual is able to consider him/her self as healthy.

Although we use the term ‘healthy’, arriving at a precise definition of health is not easy. Hamilton-West (2011) refers to a state of ‘health’ as a state of absence of illness, while elaborating on the importance of being functional with regards to daily activities.

Moreover, health and wellbeing have been characterised in terms of physical, psychological or a combination of both which could provide indicators of a state of normality; for example, when measuring anxiety or aggression where the indicators are marked outside the normal value or range. This may suggest a state of psychological difficulty and in turn, a pre-marker of ill health. The issue of health and psychological wellbeing specifically are discussed by examining the relationship between psychological wellbeing and a healthy state of functioning. At first glance, the concept of psychological wellbeing seems to relate to a state of equilibrium where positive and negative states of psyche have been maintained. There are two streams of research in this area: subjective wellbeing (SWB), and psychological wellbeing (PWB). Researchers interested in subjective wellbeing (Yung, 1933 cited in Shmotkin and Ryff, 2002; Jahoda, 1958; Erickson, 1959; Allport, 1961; Mazlow, 1968) tend to refer to overall satisfaction with life, whereas psychological wellbeing has been viewed from an understanding of human development and existential interactions in life that could be internally evaluated, such as sense of self actualisation. Understanding wellbeing, namely subjective wellbeing, has become an increasing preoccupation within the psychological mainstream (Diener et al., 1999), with studies having looked at cognitive processes, judgement and attribution (Schwarz and Clore, 1993; Tversky and Griffin, 1991), constituents of emotional experiences and responses (Zajonc 1968, 1984; Diener, Sandvik and Pavot, 1991; Lazarus, 1991), short term and long term effects of life events (Shmotkin and Lomranz, 1998), and goal related behaviours (Omodei and Wearing, 1990; Emmons, 1996; Sheldon and Elliot, 1999). Meanwhile Keyes, Shmotkin and Ryff (2002) have attempted to distinguish between subjective wellbeing and psychological wellbeing. Their findings have included demographical factors and postulated correlation with demographical factors as well as personality traits.

In the first instance it will be helpful to review the main features of psychological wellbeing and its constructs. Ryff and Keyes' (1995) model of psychological wellbeing offers an explanation for components of the psychological wellbeing construct, identifying six distinct features and in turn, creating the theory of dimensions of wellbeing.

The dimensions identified incorporate positive relations with others, autonomy, environmental mastery, purpose in life, personal growth and self-acceptance.
In recent times research on wellbeing has increasingly focused on dimensions and developing theoretical perspectives (Dodge et al., 2012; Cummins, 2010). Indeed Dodge et al. (2012) have argued that previous descriptions have focused on the dimensions of wellbeing rather than defining the state of wellbeing. Previous descriptions have ranged from dynamics of equilibrium theory of wellbeing (Heady and Wearing, 1989) to the effect of challenges on homeostasis (Cummins, 2010) as well as life span modelling by Hendry and Kloep (2002). In the process, this has led to a distorted and broadly undefined definition of wellbeing (Forgeard et al., 2011). For example, it has been reported that the concept of "subjective psychological wellbeing consists of three interrelated components; life satisfaction, pleasant and unpleasant affect" (Diener and Shu, 1997: 200). Similarly Ryff's (1989a; Ryff and Keyes, 1995) work included other components such as autonomy, environmental mastery and purpose in life, which has been modified in recent research (Seligman, 2002a; Pollard and Lee, 2003 and Foresight Mental Capital and Wellbeing Project, 2008) that has also considered life satisfaction, happiness and an emphasis on the ability to fulfil goals. While there is conceptual understatement indicating that psychological wellbeing is correlated with quality of life, defining quality of life remains subjective and hard to define. In a recent publication by the WHO (2012: 11) called *Review on Mental Health*, quality of life was defined as follows:

> "Individuals' perceptions of their position in life in the context of the culture and value systems in, which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept incorporating in a complex way the persons' physical health, psychological state, level of independence, social relationships, personal beliefs and their relationships to salient features of the environment".

Implicit in this statement is that arriving at a clear description for quality of life and psychological wellbeing is challenging; yet it is noteworthy that the relationship between health, quality of life and psychological wellbeing can be assessed.

The relationship between these variables can be tested when the multidimensional state of wellbeing is examined, offering an adaptive formulation on the state of health and wellbeing. The notion of psychological wellbeing within the context of health (in this instance, mental health) ought to be examined by reviewing the presence of specific symptom presentations such as anxiety and depression.

In summary such a correlation between symptoms of anxiety and depression could be tested when compared with positive states of psychological wellbeing. This again highlights the complex relationship between features of mental health and psychological wellbeing.

1.2.2 Psychological wellbeing and mental health

The correlation between subjective wellbeing and mental health has been a longstanding interest of many researchers, yet the key features of cognition and emotions as markers of mental health conditions are debatable (Lazarus, 1979, Folkman and Lazarus, 1984; Segal, Williams and Teasdale, 2002). Furthermore, the relationship between cognitive processes and cognitive sub-levels have been contested and debated, which has also engaged clinicians in developing or modifying approaches to overcome barriers in resistance to treatment (Williams et al., 2014; Hayes, 2010; Gilbert, 2012). Understanding the interaction between these processes and their impact on different adaptive responses will therefore offer a clearer path in understanding the correlation between mental health and subjective psychological wellbeing.

For some time, the impact of mental health, stress and emotional difficulties have been noted as significant negative contributors within society (Cooper and Cartwright, 1994). This also has been recognised by employers and employees with regards to cost implications and services provisions. Similarly, the relationships between physical and psychological wellbeing and their co-variant relationships have been observed within social and organisational arenas (Tyler, 2000; Fox, 1999), in which physical activity may influence and impact on the self-perception of an individual, leading to further positive effects upon emotional difficulties as well as self-esteem and social affiliation.

It is understood that these changes in interaction and function could be monitored and explored by examining emotional and cognitive responses to a set of specific situations (Segal, Williams and Teasdale, 2002). With this in mind, it would be appropriate to further explore these processes by assuming a closer inspection of cognition, their subsystem and their interactions, and investigating their relationship with emotion and psychological wellbeing.

As indicated previously, the relationship between cognition and emotion has been a longstanding point of debate amongst researchers, yet the main focus has remained on features and components rather than consideration of any preventative approaches, processes or measures. This issue has been further debated in recent years that include motivational factors, ability to cope and the awareness of the content and context of the experience, all of which have been considered in relation to psychological wellbeing. It is postulated that by examining the link between interactions involving cognition, emotion and psychological wellbeing should highlight the gaps within the available research.

While there is consensus that there are a number of variables that contribute to a state of psychological wellbeing, the pre-marker of psychological wellbeing is never explored. The fact remains that the cognitive processes, perceptions, mastery and coping have direct correlation with psychological wellbeing in both positive and negative states. Thus development of a method and a theoretical explanation of the key markers and predictors of psychological wellbeing will be a benefit to the current and future research. It is accepted that an appropriate method of measuring a state of psychological wellbeing requires consideration of assessment on cognition, perception, mastery and coping, as well as personality traits and a global state of psychological difficulties, such as anxiety or depression, especially when examining prediction of psychological wellbeing. The question that remains is whether the state of psychological wellbeing is predictable or whether a marker or feature is identifiable as a predictor of psychological wellbeing.

This study should be regarded as a natural progression from recent developments and research in this area given that it aims to consider the prediction of psychological wellbeing.

In order to test and develop a method of prediction on psychological wellbeing, the study must examine the quality of change within the cognitive processes. Factors contributing towards the prediction of psychological wellbeing include cognition, meta-cognitive awareness, perception, personality trait, mastery and coping. In addition, further examination on their interpolated items or sub-level correlations with the psychological wellbeing could provide an interesting read.

1.2.3 Other relational features of mental health and wellbeing

In addition to affective wellbeing, there are three other important aspects of mental health state: competence, aspiration and negative carry-over. Competence in one's life refers to the ability of that individual to manage life's challenges and the impact on their environment, and to be able to gain at least a moderate amount of success (Warr, 1994). Moreover, the reported low competence is not always considered as a sign of ill health, as it is reasonable to assume that we cannot be competent at everything. While Marie Jahoda's (1958) view of competence was in relation to mastery of environment, other views suggested an alternative where beliefs about the individual's efficacy and expectations for personal sense of mastery (Bandura 1977) are more valued and considered. Although Warr (1987) describes competence as an integral part of mental health, he acknowledged that characteristics of environment can either moderate or have a direct impact upon the extent of the mental health outcomes.

1.2.4 Recent models of psychological wellbeing

The concept of wellbeing could be modelled on the basis of global, domain subjective wellbeing and psychological mechanism where an outcome could be observed. Conceptual model of subjective wellbeing (Diener, 1984) refers to the relationship between elevated life satisfactions, high level of positive feelings and associated low negative feelings offering an overall judgement of positive personal life. The theory of judgement model of global life (Diener, 1984) evaluates where individual's domains were summed and it is associated with the positive and negative feelings. The global subjective wellbeing is associated with life satisfaction, whereas domain subjective wellbeing contains leisure.

The third component includes psychological mechanism containing detachment-relaxation, autonomy, mastery, meaning and affiliation in relation to individual's state of subjective wellbeing (Newman, Tay and Diener, 2014). The correlation between such variables contributes towards the evaluation and presentation of psychological wellbeing. Pavot and Diener (1993) cited that research in subjective wellbeing has been divided into two board aspects; an affective mode where research is relating to positive and negative affect and cognitive mode referring to life satisfaction and quality of life.

It is notable that majority of research has been focused on the affective mode, (Pavot and Diener, 1993; Newman, Tay and Diener, 2014) hence development of tools in measuring affective wellbeing compared to life satisfaction tools. The concept of wellbeing formed in humanistic philosophy that provides a two-tiered theoretical position of wellbeing (Ryan, 2009) and is summed into psychological wellbeing (PWB) and self-determination theory (SDT).

Richard Ryan in a research review (2009) discussed the concept of self-determination theory in relation to wellbeing, referring to basic needs such as autonomy, competence and relatedness that are necessary to vitality and healthy human functioning. Lamert et al. (2015) argued that there is an important difference between these two theoretical positions, explaining SDT is promoted through environmental concepts of personal relationship, autonomy and mastery and in contrast the Ryff's PWB theory is defined in concurrence with the dimensions of personal growth, purpose in life and self-acceptance. Although, there are number of overlapping components within the theoretical models, the ultimate goals of meeting the main psychological needs of an individual includes the promotion of happy living. Ryan (2009) further explained that his theoretical position was developed from five other theoretical positions including Cognitive Evaluation Theory (CET) that posit social concerns and interpersonal interactions facilitate the intrinsic motivational position. Organismic Integration Theory (OIT) refers to internalisation of various extrinsic motives; Causality Orientation Theory (COT) argues that individual differences are orientated base on environments and resulting regulatory of behaviour.

Basic Psychological Needs Theory (BPNT) indicating that the basic needs are motives to direct state of wellbeing and Goal Content Theory (GCT) describes that an individual growth and intimate relationships and personal productivity are facilitators of health and wellbeing. Lambert et al (2015) provided an overview of the roadmap of wellbeing by combining the philosophical and theoretical frameworks of wellbeing (Appendix 2). The psychological framework of wellbeing theories have been classified in six categories (Diener and Ryan, 2009) Telic theories, top-down versus bottom up theories, cognitive theories, evolutionary theories, theories of temperament and personality, and finally the Relative standard theories. The breakdown of the theory cited in Diener and Ryan (2009) described below.

1.2.4.1 Telic theories

This theory proposes that state of wellbeing is directly related to their goals and needs are achieved and fulfilled (Ryan and Deci, 2000).

1.2.4.2 Top-down versus bottom-up

In this view an individual considers negative experiences as a summary of life's negative moments leading to construct a perceived state of subjective wellbeing. Furthermore, a positive momentary experience would instigate a subjective wellbeing. In contrast the bottom-up is understood as a moment based experience relating to positive wellbeing. This means the more positive experience a person has experienced could accumulate to produce a state of wellbeing (Ryan and Deci, 2000). An individual with an outlook of positive attitude would view certain events happier than a person with a negative view and therefore considers an objective view of the causal factors in wellbeing.

1.2.4.3 Cognitive theories

The cognitive theories relate to an individual's method and mode of processing information that verifies individual's wellbeing. Cognitive theories could be understood and examined by considering biases, attention, memory and present orientation.

The information is processed and understood based on the cognitive processes, decoding and filtering through belief system (Ryan and Deci, 2000) producing an associated meaning based on perception, autonomy, control and behaviours in order to gain a state of wellbeing and therefore relating to individual's self–efficacy beliefs.

1.2.4.4 Evolutionary theories

Evolutionary theories recognises the value of positive emotion whereby the accumulation of positive emotions and wellbeing in social, physical and intellectual resources are accessed in current time or future (Fredrickson, et al., 2008; Johnson, Waugh and Fredrickson, 2010; Kok et al., 2013). This model partly relates to a bottom-up theory of wellbeing.

1.2.4.5 Theories of temperament and personality

Theories of personality and trait have shown strong correlation with wellbeing for example personality trait of extraversion is positively associated with happiness and positive emotional state (Diener and Lucas, 1999; Lucas and Fujita, 2000; Rusting and Larsen, 1997; Zelenski, Sobocko and Whelan, 2014). The theory of temperament and personality merely is referring to such correlations and state of subjective wellbeing.

1.2.4.6 Relative standard theories

The relative standard theories refer to standard of comparison between individuals past, others ideals and condition (Brickman, Coates, and Janoff-Bulman, 1978; Lyubomirsky, 2011). These comparisons could be based socially, financially or class based where an individual seeks to consider a standard and its association with wellbeing which then compared with self. The view of current and past comparison offers the bases of subjective wellbeing in an individual. Another model of wellbeing was forwarded called "the Nested Model of Wellbeing" (Henriques et al, 2014) that attempted to unify and conceptualise psychological wellbeing. Nested model was forwarded by Henriques (2011) referring to four domains that included the subjective domain, the health and functioning domain, the environmental domain and the values and ideology domain (Appendix 3).

Henriques et al. (2014) argued that their model proposes an authentic representation of wellbeing and furthermore, suggesting that their model offers a framework for examining the confusion over the hedonic and eudemonic approaches.

Researchers have been predominantly interested in examining the relationship between poor psychological functioning with markers of anxiety, depression and anger compared with physical health (Boehm and Kubzansky, 2012). Boehm and Kubzansky, (2012) discussed that although some research have indicated the coexistence of positive functioning as a protective measure (Diener and Chan, 2011) there are conflicting outcomes reported and therefore a potential for the third possibility of broader constructs has been suggested. This third construct includes personal growth, purpose in life, positive emotion, life satisfaction, happiness, optimism and physical health. This observation could be a new framework in developing a model for wellbeing.

Felicia Huppert (2009) cited a number of studies in UK and US referring to the drivers of wellbeing and their accounts towards subjective wellbeing. She described that demographic and socioeconomic factors are accounted for 10% of psychological wellbeing in developed countries, adding personality traits are accounted for 20% of wellbeing considering variation between individuals. Moreover, intentional activities reported correlating with control that also engages with drivers of psychological wellbeing (Lyubomirsky et al, 2005; Sheldon and Lyubomirsky, 2006; cited in Huppert, 2009) these intentional drivers are divided into three broad groups of motivation, cognition and behaviour. Similarities in interventions such as Cognitive Behaviour Therapy (CBT) are notable where these markers are targeted in improving psychological wellbeing. Huppert (2009) also suggested that psychological wellbeing is influenced by early environmental and maternal care that is also associated with flexible and creative thinking, good physical health and socially active behaviours. She added; although external triggers affect wellbeing, individual's attitude, drive and action have an important role in recovery and enhancement of psychological wellbeing.

In an overview of general wellbeing Diener and Ryan (2009) reported that other variables such as demographic, gender, education, age, religion, marital state, employment, income and culture have a semantic relationship with subjective wellbeing. Adding these variables was associated with global and dimensional wellbeing and account for small amount of the variance in psychological wellbeing. Diener and Ryan (2009) also suggested that stable personality traits are strongly correlated with subjective wellbeing.

1.2.5 Environmental factors and mental health

The importance of environmental factors has been recognised by a number of researchers as a contemporary model in relation to occupational stress forwarded by Warr, (1987) who referred to features that potentially could impact on wellbeing and mental health of an individual. The nine environmental features explained by Warr (1987) are: opportunity for control, opportunity for skill use, goals and variety of task demands, environmental clarity, availability of money, physical security, opportunity for interpersonal contact and valued social position. The Warr (1987) vitamin model discusses the precise relationship between the principle environmental features and mental health and wellbeing. Although occupational stress is not a concern for this thesis, it is a relevant factor with reference to psychological wellbeing. Warr (1987) noted that an individual's baseline level of wellbeing; demographic variables, values and abilities (including aspects of coping) are considered as potential moderators to psychological wellbeing. Warr (1987; 1990) further highlighted that individuals vary in their typical affective tone, irrespective of environmental factors, initiating and affecting psychological wellbeing; Warr (1987) summarised this as the presentation of a concept called '*stress*'.

1.2.6 Stress

The concept of stress was forwarded and presented predominantly by Warr (1987) describing it as an interaction between psychological and physical states, whereas recent endeavours have increasingly focused on interactional and transactional models through which stress as a concept can be explained. Stress is viewed in three domains: stimulus, response and process.

Stimulus refers to stress that is derived from life events, chronic conditions or catastrophic dealings. Response is associated with an individual's reaction to stressors that are presented as physiological, such as bodily arousal, and psychological, including emotion, thoughts and behaviours such as appearing nervous. Finally, process is viewed as a sequence of interaction and reappraisal of internal and external factors leading to a state of stress.

1.2.7 Psychological and physiological views of stress

Historically, researchers considered emotion as focal component of psychology. The theorists James and Lange introduced the earliest psychological model of stress in the late nineteenth century (Strongman, 2003). Their theoretical position explained that emotions are set as an autonomic arousal whereas stress was concerned with physiological phenomena with secondary emotional components. The shortfall of this theoretical underpinning is that it does not discriminate between emotional and physiological states. This theoretical view was further developed by Cannon (1935) who proposed the 'emergency theory', which conceptualised stress in a different format and included an urge to gain homeostasis in which the individual's protective mechanism is activated when faced with a threat and seeks a return to a protective and homeostasis state. With this in mind, it is noteworthy that more topical therapeutic approaches such as Compassion Focussed Therapy (CFT) and Eye Movement Desensitisation and Reprocessing (EMDR) therapy share such ideological stances. An individual's response to a threat could initiate two specific states seeking an adaptive response whilst exposed to the threat. In other words, physiological triggers lead to responses that include anxiety and associated fear or activate the anger response in managing or deterring the threat. Another significant development in relation to the physiological and psychological models of stress is found in the work of Hans Selye (1983) that introduced General Adaptive Syndrome (GAS), which is considered to be one of the first theoretical explanations for the interaction between physiological and psychological states. Selye (1983) described the process in a three-phased mechanism - alarm mechanism, adaptation and exhaustion - in which an individual responds to a stressor by initiating an automated sympathetic arousal system; if the arousal or stress is too strong, this may lead to an organism's death.

However, if the organism or individual is able to overcome the stressor, a state of resistance or adaptation occurs in which parasympathetic responses are initiated and a return to homeostasis is sought. This leads to a final stage of exhaustion in which insight into capacity to cope with stress is noted.

In summary, the process of emotional response to a stressor leads to an automated arousal response and reaction to either anger or anxiety that ends with a fight or flight response. The automated processes that occur are seeking an adaptive state to undergo a change in circumstances.

Similarly, cognitive theories provide an explanation for these processes and their relationship with emotion, which are constantly in a state of interaction. Although there is a unanimous agreement about the relationship between these processes, disagreement remains amongst researchers with regards to content and context of these interactions. The differing explanation for cognitive and emotional processes and procedures remains a topic of our investigation. Other debates have considered the impact of contributing factors such as mediation or moderation processes that may enhance or compound emotional or cognitive responses and their outcomes. The first factor to consider in developing a clearer understanding of these variables is the appraisal of such emotional triggers and responses. In Magda Arnold's (1960) work on the 'cognitive theory of appraisal', Arnold postulated that emotions are distinguished and characterised by exciting phenomenological processes. She was referring to recognition of emotion that requires appraisal of the situation (Scherer, et al., 2001) and in turn, establishing the notion that an emotion would only respond when it is appraised. Therefore it is essential to review the relational theoretical description of emotion and cognition.

1.3 Cognition and emotion debate

Cognition is a scientific term that is considered to be a mental process whereby information is perceived, processed, computed and evaluated for an actual response (Power and Dalgleish, 1997). The process of cognition is a highly complicated process that is in a constant state of interaction. At the same token considering emotion by its definition seems to be much more complex in nature as it may infer a number of possible explanations and processes.

For the purpose of this thesis, an emotional state should be taken as a short term affective response that may present itself in the form of stress, anxiety or depression. Views and debates around cognition and emotion have been a longstanding preoccupation for philosophers and researchers alike as far back as Ancient Greek and Roman times. The earliest known discussion around cognition and emotion acknowledges Plato and Aristotle, in which the processes of cognition, emotion and cognition motive were explored by examining and discussing the conflict between the three domains of desire, reason and passion.

Richard Lazarus (1999) refers to a more recent representation of these three domains in terms of cognition, motivation and emotion. Other significant markers reported by Lazarus (1999) include coping with the emotional process, which is directly dependent on both cognition and motivation. This enduring philosophical tradition has been responsible for the genesis and subsequent developments of psychological perspectives that emphasise the cognitive mediation of emotion and motives (Bolles, 1974). Furthermore, Bolles (1974) offers a discussion around the scientific view of cognition and emotion that has long been demonstrated in terms of a neurological and biochemical representation. This view attempted to focus on the physical processes in the brain where perception and thinking were considered in relation to certain neural exchanges and as such it was simply characterised as a neurochemical processes. More recently within cognitive studies, a number of researchers have taken a more phenomenological approach, such as Kurt Lewin (1935) and Harry McClelland (1951) who explored the dynamics of personality and cognition. And Harry Harlow (1953) who conducted experimental work into attachment. Other theorists and researchers have helped to shape our current understanding of emotion and cognition. Research and debates in relation to individual differences, motives and perception that took place during the 1930s and 1950s still significantly influence current applications of theory to practice in spite of the lack of progress in some areas of practice. This lack of progress potentially raises a question about the efficacy of some approaches currently being delivered. However the arguments about cognition and emotion took a different turn in the 1980s when the primacy of cognition or emotion was questioned and debated.

In particular the topical concerns with cognition and emotion were initiated by Robert Zajonc's (1980) during an academic presentation on feeling and thinking. During this presentation, Zajonc took exception with the notion that emotion and affect are a post-cognitive response and instead discussed emotion as being independent of cognition. In contrast is Richard Lazarus' (1967; 1982) description of primary and secondary appraisals, which reflected on the value of perceived affect and coping with regard to the given experiences. Meanwhile, Joseph LeDoux (1986) also provided a discussion on the neurophysiology of cognition and emotion, which has further enhanced our understanding of the processes.

The contributions from Lazarus, Zajonc and LeDoux all helps us to develop a clearer understating of the interlinking and complex relationship of emotion and cognition. Therefore it is reasonable to examine these contributions, beginning with the transactional model of stress.

1.3.1 Transactional model of stress

In recent years, the transactional approach has been utilised to describe an emotional state within psychological perspectives. Nevertheless this ideology has further suggested an individualised subjective point of view. This means an individual will either be able to engage or not with their environment based on their interpretation or perception of that given situation or environmental trigger. Richard Lazarus (1966) introduced the transactional model of stress, which takes into account both individual and environmental factors whilst considering internal and adaptive dialogues and processes. The transactional model of stress places the individual at the heart of the model and examines the mediating factors in the development and maintenance of stress. This may include personal resource, values, cognition, level of support and external triggers. The adaptive process is continuous in nature, reciprocal in presentation and relative to the internal and external factors that initiates stress. The model elucidates two main features: the individual's cognitive processes and the experienced stress.

The active and passive transactions between the external factors and an individual's values, resources, cognition and personality trait will provide suitable grounds for any description of this model.

These transactions lead to further cognitive processes and emotional dispositions, whilst the experienced external and internal stimuli are appraised. One of the shortfalls of the transactional model of stress is the lack of consideration for severe fatigue without any psychological impact (Cox, 1978). Moreover, the transactional view succeeded where Stimuli Response (SR) based models did not, which is partly due to the fact that SR models did not take the individual's psychological characteristics and cognitive processes into account. The main feature of the debate in this instance is the focus on stress and appraisal of such experiences that are cognitively based, dispositional or both.

A significant number of researchers have contributed to the development and understanding of the concept of stress as epitomised by Richard Lazarus (1966; 1981; 1991) and Tom Cox (1985; 1987).

1.3.2 Cognitive motivational relational theory

The role of cognition in emotion has been controversial in nature and continues to be debated. The plethora of research refers to the construct of cognition and emotion that signifies the link between perception, cognition and emotion. The cognitive perceptual responses are initiated, developed and processed in recognition and dissemination of environmental information. It is generally agreed that psychological characteristics can be sub-divided into emotion and cognition. Emotion experienced by the general population is considered to possess five facets: happiness, love, sadness, fear and anger. Cognition is represented and observed in the form of values or beliefs, thoughts and attitude. The main issue of debate seems to be concerned with the primacy of responses and sub-level processing of information to a given stimulus. Richard Lazarus's cognitive motivational relational theory (1991) was further developed; reformulating his previous findings, while his model of stress has been supported in some quarters and contested in others.

1.3.3 Lazarus' model of stress

Richard Lazarus has provided a more contemporary explanation for the model of stress, which has since been reviewed and modified further in recent times. One of the most discussed topics in this area is his cognitive theory of stress, which he put forward with Susan Folkman (1984).

Other postulations within this theoretical stance include the relationship between stresses and coping that since has been examined by other researchers. Some researchers argue that the relational factors that might contribute towards and are correlated with stress could also act as predictors of stress (Aldwin, 1994; Folkman, Lazarus, Dunkel-Schetter, Gruen and DeLongis, 1986). This suggestion would be providing a clue to their contributory relationship towards psychological wellbeing. Poignantly, Lazarus and Folkman (1984) referred to appraisal and coping as mediators of stress and response, in which this discrimination is proffered as an explanation for individual differences in social behaviours.

The mediatory position as a viewpoint may also provide an explanation in their relational factorial positioning, enabling the indication of the link between an individual's beliefs about their personal control and their interaction with their environment (Folkman, Lazarus, Pimley and Novacek, 1987). Subsequently, this will help the individual to provide an appropriate response based on actual personal commitment, control, self-efficacy and perception. These cognitive processes allow an individual to decode the information that has been absorbed and in turn lead to the management of that encounter. Lazarus (1991) further modified his proposal to five meta-theoretical themes that constantly interact that provides the basis of his model. Doing so he explained that an emotional experience is a process based on a continuum rather than a separate event. With regard to primacy of affect and primacy of cognition, Lazarus (1991b) reflected on previous discussions and contributions made by other researchers, suggesting that his model is a more adequate way of expressing the link between emotional and cognitive primacy. Lazarus (1991) modified and reported five phases within the process: system principal, emotional process, developmental principle, specificity principle, and rational meaning principle. The concept of system principle acts as a mediator when a stimulus has been initiated and refers to a set of emotional responses produced by interaction between precursor, mediating process and outcome of the interaction; it may also be a marker for response variables.

This means that there are no specific variables alone that can adequately explain the emotional process or its outcome. The system principle is flexible in nature by attempting to accommodate the required response or responses.

The second feature includes an emotional process that is structurally divided into two specific aspects, which are the process and the structure principle. The process is continuously fluctuating or changing and therefore allows for a dynamic interaction to occur. On the other hand, the structure principle relates to the relationship between the person and their environment, resulting in recurrent emotional patterns in the individual. This could also be seen as an automated process where the information is entered into a loop and a response is provided in an automated format.

The developmental processes of individuals relate to an indication that changes in both biological and social factors have a direct link with and contribute to their development. This may influence later life functioning and responses that they encounter in the future. This can also contribute towards emotional reaction (emotional reactivity) and additionally might instigate changes that can occur at any stage of individual's life. At the same time, the specificity principle refers to each specific emotional process that is responsible for a specific emotional response and it is linked with and explained by emotional theory. This specificity principle suggests that each process is specific to an emotional response that may manifest itself with specific emotional responses such as anger, low mood or anxiety. Finally, the relational meaning principle refers to an interpretation of emotional state triggered by the specific relational meaning. This is achieved by providing an appropriately required response that is dependent on the information and perception of meaning attached to that information. Lazarus (1991) referred to appraisals of the information and coping, inferring that the information processing is being decoded and appraised, thereby providing evaluation of the gathered information and in turn leading to an appropriate response. The relationship between the processes taking place, decoding of information and taking an appropriate response is considered as an appraisal. Appraisals are divided into primary and secondary levels, both of which are considered as markers of an individual's thinking style, perception and coping ability.

Smith and colleagues (1993) further examined and explored the appraisals and considered further adaptation that included six dimensions. They also subsumed the primary appraisal in two components and secondary appraisal included four components. They reported that depending on the different emotional state of an appraisal, an appropriately relevant component to that state would be involved and instigated. Previously, Lazarus (1982) reported that primary and secondary appraisals should be considered with further subdivision with their own specific components.

Primary appraisal is concerned with the situational judgment of an individual's own wellbeing, which involves constant monitoring of their interaction with their environment. Additionally, the greater the perceived personal involvement in an encounter, the greater the emotional response ought to be to that situation.

Primary appraisal is more concerned with social image and self-esteem and their associated meaning, all of which are affected by positive or negative event relevance to the individual. The systematic view of primary appraisal comprises of two subsections, which are Goal Relevance (GR) and Goal Congruence/Incongruence (GC/GI). GR refers to cognitive processes that involve emotional states that are experienced by an individual. It relates to the context in which an encounter has been perceived as a threat or otherwise. Essentially the subsequent emotional reaction will incur if the goal relevance exists. This would suggest that the primary appraisal component is linked to emotional reactions of a negative nature, such as anxiety and low mood. On the other hand, GC/GI refers to the intent of willingness or unwillingness towards achieving the personal goal. The goal is about being responsive to a positive (congruent) or a negative (incongruent) emotion. Achieving a goal in this instance is directly dependent to the degree of facilitation and quality, as well as the type of emotions experienced. Moreover, they are linked to secondary appraisals.

Lazarus (1982) considered secondary appraisals in terms of the process of assessing the resources available to the individual in dealing with the situation. This may be considered as resilience or coping factors that are in place to assist the individual in managing the experiences caused by internal or external variables. The assessment and availability of resources are considered at this level.

In the process, Lazarus suggested that, when an individual is able to evaluate and analyse the problem as being current and present, this will lead to a subsequent and an appropriate action. In turn this would initiate a coping strategy or behaviour in dealing with that given situation or trigger. This means that the secondary appraisal focuses on evaluation, analysis and method of dealing with the experienced situation, leading to the development of coping strategies. In summary, the secondary appraisals process includes assessment and evaluation of resources and review of the availability of such resources. Then initiating a process whereby the impact is being identified and managed or considerations are given in strategies that could be utilised in order to manage a given situation.

There are four aspects within the secondary appraisals process: accountability, problem-focused coping potential, emotion-focused coping potential and future expectancy. Accountability relates to an individual's ability to recognise and cope with the situation and is achieved by considering whether the individual is to be blamed or being credited in a given situation. This process may cause frustration for the individual who might be directed at oneself (internalised) or externalised towards others, or objects. Accountability is concerned with the ability of the individual to cope with the situation. Consequentially, further difficulties may arise when the dispositional presentations develop from a sense of unaccountability or lack of accountability. The problem-focused coping potential is a component that describes an individual's ability to manage the perceived demands from an encounter. This coping style is activated by using resources and considering adequate coping skills for finding resolution to the identified problem. The emotion-focused coping potential refers to the ability of an individual who is able to adequately evaluate the perceived experience and apply an appropriate response to a situation; in other words, it is concerned with being able to promote and enhance a positive state of mental wellbeing in that encounter as well as remain positive in possible future encounters. Future expectancy refers to an individual's expectation and anticipation of future changes. This feature is linked to the GC and acts as a result of anticipatory change, which has a direct effect on an individual's perceived ability to adapt to changing circumstances.

Furthermore, it is considered as contributing towards an individual's expectation of psychological wellbeing. The expectation and perception of a possible change undergo evaluation within this paradigm. This could enable the individual to be more in tune with possible changes in their circumstances.

Lazarus further proposed the existence of a third stage and named it 're-appraisal' of the experience in which the situation and coping strategies are monitored and if necessary altered (Parkes, 1990). The process of re-appraisal provides evaluative measure and examines responses that are based on previous encounters. It is also considered as the most appropriate response to environmental triggers, although this may not necessarily be helpful to an individual. Re-appraisal culminates in an evaluative approach by the individual, identifying whether the coping strategy they deployed has been successful in dealing with the threat or situation. Their re-appraisal could then inform how they respond to similar situations in the future, thereby developing a coping loop (Lazarus, 1993).

One of the main concerns for an individual is the potential for a poor appraisal of a situation, which could develop into an unhealthy coping loop and therefore contributing significantly towards their psychological wellbeing. The processes of appraisal and coping have been described in the work of other researchers, including the transactional model of stress forwarded by Tom Cox (1985; 1987), which offers an alternative point of view on stress and appraisal of stimuli.

1.3.4 Cox's transactional model of stress

Cox's transactional model of stress relates to the evaluation and perception of threat, and attempts to seek the equilibrium state of psychological wellbeing. This homeostasis balance is maintained by the ability of an individual to adequately manage the demands presented by both internal and external factors without having a residual impact on their state of mental health or psychological wellbeing. The Cox's model (1985, 1987) possesses five stages. The first stage is initiated when a range of 'strains' faces an individual. These strains are initiated in response to both internal factors, including physiological and psychological, as well as external, or environmental, factors. The demands could be presented to and observed by the individual concerned as a combination of these factors.

In stage two, an individual appraises a specific situation by comparing and analysing the internal and external demands. This is achieved when the resources available to that individual are considered when dealing with the perceived demands. In other words any inability to restore equilibrium for the individual can cause stress and that level of stress will increase when an individual is unable to restore balance within a shorter time frame.

This may eventually lead to an experience of a negative nature, which will impact on an individual's wellbeing in general. Appraisal is a prominent feature of this process as it involves both actual and perceived demands as well as primes the coping resources available to an individual in dealing with such demands. The perceived inequality experienced in stage two will result in the instantaneous subjective experience of psychological and physiological changes in an individual, leading to the process of stress.

DeLongis et al (1988) referred to difficulties with recognising stress as a simple variable that could be better understood as interdependent processes, consisting of appraisals mediating type of psychological or somatic responses experienced as well as their frequency, intensity and duration.

The process of stress as outcome will be recorded in the same way, making it impossible to distinguish between what triggers the threat, being an external event or the result of a negative thought. This then will initiate an attempt to restore equilibrium both physiologically and psychologically. The result includes initiating a coping process that is integrated within the appraisal system, linking this to the perceived manageable or unmanageable coping mechanism. This information will then instigate and prime the stage four, which refers to coping behaviours activating within an individual and initiating an appraisal of the situation that would provide an evaluative response (re-appraisal) to the perceived coping strategies. Utilising this evaluation, the individual is able to boost their confidence in dealing with similar situations in the future. This could, therefore, provide a positive state of mind and wellbeing for that individual in relation to possible future engagements.

The fifth and final stage is initiated when the overall evaluation of an individual's ability to deal with a stressful situation takes place. This in turn, provides a direct link to the perception of their situation and future management of similar experiences or responses. On reflection, the respective models of stress from Lazarus and Cox have both predominately referred to the process of exposure to stimuli, recognition or appraisal of the experience, attribution of the stimuli and initiation of an adequate response in meeting the desired need. In the process, this emphasises a clear relationship between attribution, appraisal and emotional responses (Smith and Haynes, 1996), suggesting that attribution and appraisals are at a crossroads and are combined in managing an emotional reaction.

Furthermore, the development of psychological reasoning for stress and cognitive processes appears directly related to criticism that is aimed at the physiological and mechanical approaches (Cox, 1993). It is understood that this has been subsumed into two levels of interactions.

These interactions are demonstrated at the structural level, including an individual's interaction with their environment, (French, Caplan and Van Harrison, 1982) and the transactional model, which focuses on the psychological foundation of these interactions (Lazarus and Folkman 1984; Cox, 1990). The processes and sub-level interactions between the environmental or internal variables are also considered as hypothetical and unclear; this is in spite of a number of theoretical explanations in this respect. This is partly due to the fact that interaction and impact of cognition and its sub-levels and emotion are complex and intertwined.

One of the most researched areas in cognition, emotion and psychological wellbeing relates to studies on depression. There are significant amount of research that have referred to three main scopes of appraisal within their corresponding investigations: perceived impact, uncertainty and mastery (Biron, Truchon and Lemyre, 1992; Fillion, 1993; Karasawa, 1995). These theoretical representations also result in another set of dilemmas. In order to arrive at a clearer understanding of appraisals and their processes, it is essential to consider all contributing variables to psychological wellbeing.

1.3.5 Summary of transactional models

The biological and psychological models of stress have provided a number of theoretical explanations. In terms of psychological understanding, it is clear that cognitive appraisal is central to understanding the process of stress and emotional responses. There are also clear markers that interplay within the process of appraisals, namely emotional response and stress. Lazarus (1991) describes stress as a psychological state that directs an individual's appraisals and management of confronted demands. The primary appraisal is affiliated with the degree of perceived personal involvement to self and wellbeing with the likelihood of emotional reaction. Lazarus' work mirrors that of Erikson, who argued that an individual's role, relationship and function in society drive the dynamics of internal interactions. The appraisal is relational to approval or self, where the perception could initiate emotional reaction, such as anger associated with attack to self and threat to self by resulting in fear response. Secondary appraisals are mainly concerned with coping and coping strategies utilised by an individual in the management of faced emotional difficulties. Coping potentials have two main qualities that can be summarised in terms of the management of one's ability to respond to an encounter as well as evaluate their perceived ability in order to maintain psychological wellbeing. Similarly, Cox (1987) reviewed and introduced a new notion of cognitive appraisals, which included perception of the situation, other characteristics of coping and the resources available to help the individual to cope during present and future experiences. The main conclusion here is concerned with how these features might contribute towards emotional reactivity and therefore impact on an individual's psychological wellbeing. In order to explore this further, it is necessary to examine the relationship between appraisals, emotion, coping, personality traits and mastery.

Finally, there are overlapping features within the transactional model of stress, for example, appraisals and their roles as mediators of emotion has been recognised by all models. Similarly individual's ability to cope in response to distressing stimuli is another feature where overlaps could be noted. However, there are differences in stages or orders of responses to the external stimuli that has been debated.

As previously described the rationale for considering discussion around the transactional model of stress was based on its association with the symptoms of anxiety and low mood. In addition the contributory role of other factors such as coping and control in management of stress are considered essential for inclusion. The distinction could be drawn from these models and their intent by exploring the appraisals and their relationship with emotion.

1.4. Cognitive appraisal and emotion

Other researchers in recent times have attempted to specify the cognitive precursor of emotion (Smith and Lazarus, 1988; Smith and Lazarus, 1990; Smith, Lazarus, Haynes and Pope, 1993).

By identifying a theoretical distinction between causal attributions and appraisals, they sought to hypothesise that appraisals are a more proximal precursor of emotion. Thereby arguing that appraisal should be considered as a mediator in the relationship between attribution and emotion. This view was summarised in a study by Smith and Haynes (1996), which reported that the relationship between appraisal and emotion is noticeably stronger than that between attribution and emotion. Meanwhile Lazarus debated that the relationship between cognition and affect may introduce an integral mediator within the process of attribution and affect. This view has been challenged by Zajonc (1980) argued the affect is at least partly independent of a cognitive system. Zajonc (1980) suggested that cognitive system and affect usually function together, whereas affect could start without prior cognitive processing. This explanation from Zajonc (1980) has also been observed and reported by clinicians, in which the absence of cognitive indicators has been recorded even though individuals reported dispositional symptoms.

Zajonc (1980, 1984) further expressed that individuals make judgements without much processing of information about others and objects. In his earlier study, Zajonc (1968) found that, amongst his research participants, stimuli become more preferred after repeated exposure and sometimes without conscious awareness even after the repeated exposure; he referred to this phenomenon as the ‘mere exposure effect’.

Further explanations have provided different perspectives in examining the relationship between emotion, cognition and coping as well as motivational issues (Lazarus, 1982, 1991, 1993; Cox, 1990; Lazarus cited in Dalgleish and Power, 2000). Lazarus' (1996) introduction of emotion and appraisals as mediators of cognitive processes has provided an initial explanation for the relational factors between cognitive appraisals and emotional responses.

Later, Lazarus and Chen (1977) explained that an individual's attempt at regaining physical and psychological wellbeing in response to internal and external factors is in order to recapture the state of equilibrium. Lazarus's model of stress, which included primary and secondary appraisals was subsequently modified (Lazarus, 1991) and reformulated as the 'Cognitive-Motivational-Rational' model.

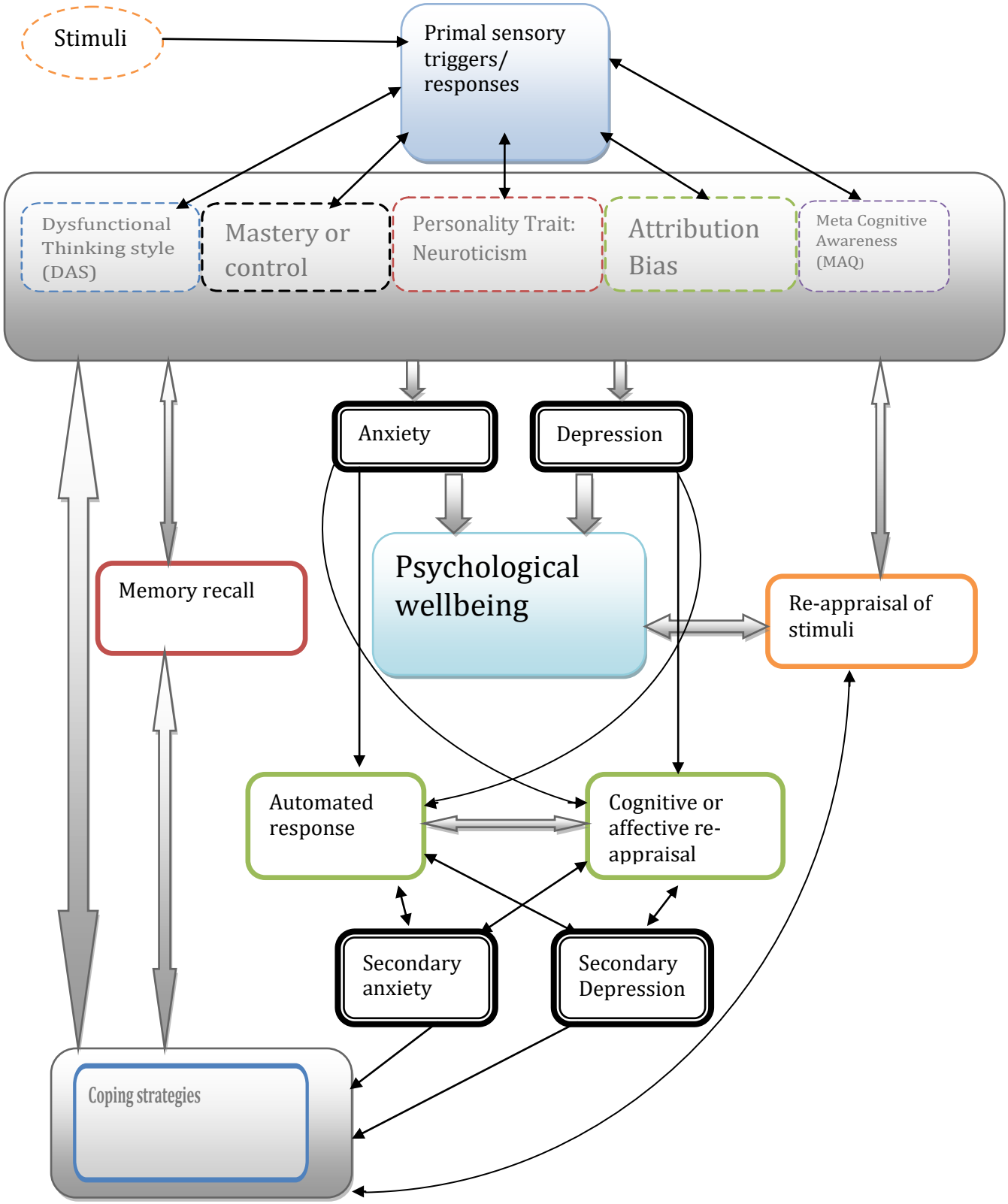
Although Zajonc (1980) reported that emotional responses did not require conscious awareness, Lazarus' cognitive theory dismissed this finding by suggesting that any emotional responses require a degree of cognitive involvement. Lazarus (1982) argued further that the appraisal of participants within Zajonc's (1980) study had been manipulated (for example, it was claimed that the participants were affected due to receiving instruction). Lazarus added that, although appraisal was a necessary condition for affective responses to occur, it might not always be at a level of conscious awareness. However, there is agreement that relationships clearly exist between attributions, appraisal and emotion. Smith and Haynes (1996) for instance, claimed that attribution and appraisals combined in order to manage an emotional reaction. Research into appraisal and its relationship or adaptation with other components of cognition (importance, impact, control, threat, ambiguity, uncertainty, mastery, un/predictability and un/desirability of an individual's physical or psychological wellbeing) is ongoing.

At the experimental and theoretical level, appraisals reflect on three main scopes: perceived impact, uncertainty and mastery (Biron, Truchon and Lemyre, 1992; Fillion, 1993; Karasawa, 1995). It is evident that there are constant interactions between emotions and cognitive processes (Eysenck and Keane, 1998), so therefore any attempt in providing an explanation that dismisses either of these components would be heading for failure.

Some theorists (Power and Dagleish, 1997) have gone further by stating that cognition and affect cannot be separated. Another dimension to these processes includes the organisational and cognitive-emotional relationship, which argues that emotions go through four distinct stages (Liu and Perrewe, 2005). The first three stages relate to the primary and secondary appraisals, including emotions of high arousal and anticipatory emotions. This could change to a positive or negative emotion depending on situational factors. The final stage includes the coping behaviour, evaluation and induction of specific actions in response to the stimuli. This model postulated that there are clear interactions between cognition, perception of the identified stimuli and motivation or ability to cope with that given experience. These processes occur in order for the individual to seek a state of normality or equilibrium as previously experienced by the individual. The essence of observing these interactions could be understood by a review of an individual's early experiences, where appraisals and attributions of situations are developed. In addition, other factors could further complicate internal interactions such as interference from external stimuli and an individual's ability in managing their interaction with both internal and external triggers. These interactions will include the primary and secondary appraisals, negative affectivity, control and awareness of the experience. Factors that contribute directly on the cognitive processes vary in nature, but mostly are influenced by aspects such as early years' experiences, biological condition, psychosocial factors, personality traits, mastery and attribution, which in turn would provide a picture of subjective psychological wellbeing.

In summary, it would be naive to assume that emotional responses are the primary processing mechanisms that are closely linked to a bio-sensory network. However, the response could be a situational specific whereby an evolutionary drives takes precedent. Moreover, the absence of an evaluative response may lead to the lack of appropriate interpretation of the threat, therefore as a consequence a different set of interpretation of the situation and responses could occur. Having considered all potential contributors to the psychological wellbeing an overview of such interactions would provide the basics of theoretical position in this thesis. Therefore, in order to summaries and conceptualise the discussed models a theoretical framework shown in figure 1 is demonstrated as an overview of the hypotheses for development and consideration of this thesis.

The theoretical framework for the hypothesised model of psychological wellbeing



This matrix of cognitive communication is a simplified version of the symbiotic connections between the reported features. Some of the features have a greater contribution, dependent on an individual's cognitive abilities and flexibility. Displayed in grey; the core dimensions and their interlinking sub-systems are presented as predictors of distress, anxiety and depression.

Figure 1 Theoretical Framework

It is noteworthy to mention that emotion and cognition remain partial to one another as well as towards other variables such as negative affectivity, individual mastery and coping, which could be represented as dispositional traits. The relationship between cognitive processes, coping and psychological wellbeing has been investigated previously by number of researchers, yet the notion of the dispositional indicators of psychological wellbeing remains the target of many academic debates. Using psychological measures for people with depression has been a longstanding practice within the field of psychology and psychotherapy (Beck et al., 1979). The main aim of using such measures is to enable practitioners to predict and measure the severity of the identified depressive symptom.

There is also a relationship between the use of such measures in identifying the most suitable intervention based on the assessment and presentation of the problem (Sander and Wills, 2005); this is outside the scope of this thesis. In line with the purpose of this current research, the focus will be applied to the dispositional appraisals of depression and anxiety. Moreover, the correlation between dispositional appraisals and other variables such as personality traits, coping and mastery that are closely associated with psychological wellbeing; this will be reviewed at a later stage.

1.5. Individual characteristics and dispositional traits

The discussion so far has provided a brief account of psychological wellbeing, stress and mental health. The focus will now shift towards the psychological characteristics of an individual. These characteristics enable an individual to discover and maintain a helpful or unhelpful response in conditions of a stressful nature, determining the extent to which they maintain a state of psychological wellbeing (Kokkinos, 2007).

Previous researcher's contributions such as Alder's psychological development work have referred to the early developmental features and characteristics of an individual. When an individual is concerned with the seeking a state of perfection where unmet needs may be transformed into inferiority or where an awareness of this outcome might motivate the individual in increasing drive in achieving the required response.

Alder proposed that psychological development consists of processes that are largely cognitive-based, evolved from experiences and constructed from internal biological constituents that are associated with environmental interactions. Meanwhile, Erikson's model of psychosocial development produced a clearer framework containing eight developmental stages, which suggested evolutionary progression in the development of ego and personality as well as psychosocial development. Erikson's theory highlights a close link with Freud's psychosexual development theory with the human life cycle at its core. However, Kelly's psychology of personal constructs indicates that the construct of cognition is based on individual's belief, attitudes and thoughts; this has been referred to as personal construct psychology.

Personal construct psychology in essence refers to subjective processing of information, which is interpreted by individuals in a manner that makes sense to them. Kelly also indicated that the core constructs are general in nature and are crucial in assisting an individual in prediction and perception as well as in behaviours. Other theorists such as Albert Ellis and Aaron Beck subsequently progressed the understanding of the link between personality, core constructs, cognition and emotion that are applicable in clinical practice. Although developmental characteristics offer a striking description of personality, dispositional theories will be the next focus of this discussion. Dispositional theories of personality refer to personality types and personality traits as two main features of personality construct. It is understood that the personality types are mainly focused on the premise that an individual could be categorised based on their attitude, temperament and emotional disposition. Alternatively, personality traits are referred to in relation to the quality, preference and organisation of an individual's control and behaviours. The personality characteristics of an individual have an influence in support or prevention of their psychological wellbeing (Kokkinos, 2007) and are correlated with other individual internal factors including coping and mastery (Folkman et al., 1986; O'Brien and Delongis, 1996; Smith and Dust, 2006).

1.5.1 Personality constructs and traits

A meta-analysis of several studies (Ozer and Benet-Marinez, 2006) on the relationship between subjective wellbeing and personality have summarised correlation with work (DeNeve and Cooper, 1998), economics (Frey and Stutzer, 2002) and gerontology (Isaacowitz and Smith, 2004), all of which show personality as one of the portent predictors of subjective wellbeing (Steel, Schmidt and Shultz, 2008). It has been the longstanding intention of researchers to establish a taxonomic position of personality traits that is generally acceptable. Most personality traits are described in five broad domains, consisting of extraversion, agreeableness, conscientiousness, emotional stability and openness to experience; this is referred to as the five-factor model of personality traits (Digman, 1990; John, 1990; Goldberg, 1993; Robins, et al., 1996). It is understood that the aforementioned five dimensions provide a description of regulatory processes that result from different sets of behaviours. The most striking issue to consider are whether the person typologies and trait dimensions function complement one another or whether they should be perceived as competing systems.

In essence, the characteristics of an individual are in tune with their personality construct (John and Robin, 1994). Moreover, Paul Costa and Robert McCrae's (1980) study examined the relationship between personality and happiness or subjective wellbeing, noting that different sets of traits influence affect (namely, extraversion and neuroticism).

Furthermore, individual differences (Eysenck, 1990) are considered central traits, summarised in terms of extraversion versus introversion, neuroticism and psychoticism, which are closely linked with individualised traits. Extraverted individuals present lower levels of arousal compared to introverts, but the former also seek more stimulation. Neuroticism is often linked to a reactive autonomic nervous system and a marked affiliation with an emotionally unstable state, whereas psychoticism tends to be seen as state that has a disregard for common sense and in which impulsive behaviours are evident.

1.5.2 Coping

Coping can be depicted as responses by an individual to internal and or external demands that are cognitively or behaviourally based (Folkman, 1984; Folkman et al., 1986a; Pearlin and Schooler, 1978) in order to maintain their mental or physical wellbeing.

In other words, coping is a method by which an individual seeks to respond to external stimuli with the intention of avoiding or averting emotion distress. There is a plethora of literature that focuses on coping strategies, and affective and behavioural responses to life stress (Billing and Moos, 1981; Folkman and Lazarus, 1980; McCrea and Costa, 1986), in which coping has been divided into three main categories: problem-focused coping (when an individual can adopt a direct response to or have a direct influence on the stimuli using problem-solving skills), coping that relies on decision making, or coping by undertaking a direct action. Emotion-focused coping is different in essence because the coping position is adopted in response to emotional distress (Folkman et al., 1986b). That said both these types of coping can be changed over time. Appraisal-focused coping is considered dependent on the processes of appraisal of the situation and closely linked with emotion-focused coping (Moss and Billing, 1982).

Meanwhile, Edwards and Baglioni's (1993) study examined underlying coping dimensions with the use of two sets of measures: the 'Ways of Coping Check List' (WCCL), which is a 67-itemed questionnaire based on the Folkman and Lazarus transactional model of stress, and the 40-item Cybernetic Coping Scale (CCS). The study concluded that there are eight coping dimensions: confrontive coping, distancing, self-controlling, seeking social support, accepting responsibility, escape avoidance, planful problem solving and positive reappraisals.

Originally the CCS was developed by adopting elements from other coping scales (Aldwin et al., 1980; Billing and Moss, 1984; Latack, 1986; Pearlin and Scholler, 1978). The CCS lacked clear structure until the introduction of Edward's (1992; 1993) cybernetic theory of stress, which refers to an individual's perception in response to stress with the aim of increasing coping and wellbeing (cited in Guppy et al., 2004).

Edwards (1992) proposed five modes of coping that underpin his cybernetic theory of stress; these are, changing the situation, accommodation, devaluation, symptom reduction and avoidance. These modes show the relationship between coping and stress in response to external stimuli within the operational and organisational context. Coping resources adopted in the management of distress are two-fold according to Pearlin and Schooler (1978), who claimed that they referred to an individual's personality characteristics and their social relationship with their support networks. Furthermore, Pearlin and Schooler (1978) explained three forms of responses are applied in the management of distress, which are to change the situation, control the meaning and increase function. Similarly, Latack (1986) postulated three coping methods: control where an individual's behaviours and cognition are reappraised; escape, which is similar to control and is concerned with containing both cognition and action with avoidance tendencies; and management of symptoms by undertaking active action such as exercise or relaxation. Symptom management could be negatively based, such as through the use of illicit drugs or unhelpful acts, or could contribute positively in symptom reduction. Dewe and Guest's (1990) study examined potential coping dimensions by examining 223 participant responses with the use of a Principle Component Analysis (PCA).

In the process, they were able to identify six coping dimensions that related to rational task orientated behaviours, emotional release, the use of social or domestic resources, recovery and preparation, postponed action and passive attempts. Dewe (1991) added a further dimension, which was referred to as 'trying not to let it get to you'. This final dimension has been closely correlated with dysfunctional constructs (Rick and Guppy, 1994) in which significant negative correlation with this item was reported. Furthermore, Guppy and Weatherstone (1996) observed variation between different coping strategies and their effectiveness, concluding that problem-focused types are associated with positive outcome while social support may have a protective role against certain types of work-related stress. Dewe, Cox and Ferguson (1993) proposed that coping should be seen as a process that is interactive and reflective in nature, as well as dependent on the individual's environment. As such, the process of considering primary and secondary appraisals should be deemed essential to understanding coping.

Moreover, Guppy et al. (2004) examined the psychometric properties of CCS in which a number of shortfalls in composition and structure of coping dimensions were highlighted, as well as dispositional features of coping strategies. They argued that the majority of studies has utilised situation specific coping measures, which has led to dispositional measures of general coping (Carver and Scheier, 1994; Rick and Guppy, 1994). Their study included a large sample from four sites utilising a confirmatory factor analysis and modifying the CCS from a 20-item version into a 15-iterm version instead.

Other influential factors impacting on an individual's coping strategies include emotional regulation, appropriate appraisal of the situation, and affectivity and personality of the individual. Thus far we have discussed personality, emotional and cognitive features associated with stress and wellbeing.

1.5.3 Control and mastery

Both control and mastery are phenomena in human behaviour that is undertaken by an individual in order to manage their environment or internal demands. Cognitive control is considered as the most effective type of control strategies (Cohen, et al., 1986) and is divided into five types: behavioural, cognitive, decisional, informational and retrospective control. The topic of control and its relationship with other processes has been the subject of numerous studies. This has led to number of theoretical formulations distinguishing control in two categories: primary control, in which an individual attempts to control their environment in line with their desire or needs (Heckhausen and Schulz, 1995); and, secondary control, which relates to internal processes that are activated towards motivational and goal direction in order to cope with failures and, in turn, endorse primary control. The relationship between primary and secondary control was conceptualised by Rothbaum, Weisz and Synder (1982), while similar studies also exist on problem-focused and emotion-focused coping, such as Folkman, Lazarus, Dunkel-Schetter, Delongis and Guren (1986). The primary model of control is described in terms of having two levels (functional and dysfunctional) based on two types of control (veridical and illusory) adopted by an individual (Heckhausen and Schulz, 1995). With this in mind, other types and levels can be formulated.

For example, veridical and functional control could enable the promotion of short term and long-term primary control; conversely, the combination of illusory and dysfunctional could lead to the adaptation of the most harmful types of primary control strategy. The latter manifestation could be found amongst individuals suffering with serious illness who may have illusory beliefs and seek to gain control of and cope with their experience in order to achieve wellbeing or a state of equilibrium. Similarly, the secondary control has been formulated into two levels, with three-dimensional types. The secondary (or internal) control contains an additional type labelled as a value or attribution in which a functional response may include devaluation or biases towards unattainable goals.

The role of secondary control in relation to self-esteem and self-blame has been investigated previously (Alloy and Abramson, 1979; Lwinsohn, Mischel, Chaplin and Barton, 1980) and suggested a connection with a protective mechanism of self-esteem that is based at the functional level and of self- blame at the dysfunctional level. The evidence thus far suggests that control is fostered in order to enable an individual to regain control over their environment and, in turn, manage the corresponding demands. The types and levels of control vary in nature and are highly dependent upon a multitude of factors, including biological and developmental, while their direct correlation with coping, appraisals and attribution are evident.

1.5.4 Attribution

Attribution or perception refers to the perceived view of a given incentive. It is closely linked to cognitive processes, yet it is a standalone mechanism. Attribution of an individual could be viewed as either positive or negative in response to an event. The perceived response has its origins in the learnt theory of helplessness according to Seligman and Maier (1967), who conducted an experiment on a dog in order to demonstrate their theory. The dog was confined and electrocuted to the point of resignation and, when the dog was placed in an environment where it could escape, the dog did not make any effort to escape the shock. Seligman and Maier (1967) also suggested that the learnt behaviour of the dog and its sense of resignation were similar to the learnt helplessness of a depression person.

In essence, the perception of the cause is dependent on the Attributional style adopted. Attributional style is a pattern whereby events and information are explained and perceived, which leads to a behaviour that could be instigated due to internal or external factors (Weiner, 1974; Abramson, Seligman and Teasdale, 1978; Anderson and Arnoult, 1985). Three dimensions of an individual's attribution were discussed and forwarded by Abramson et al. (1978). The first dimension is concerned with the locus of causal explanation that is attributed internally and potentially triggers a negative stance towards self. The second dimension refers to the stability of causal explanation, which is associated with persistent and transient perception. The final dimension is concerned with global causal explanation, which relates to all aspects of life. When these dimensions are applied to positive or negative life events, the dissimilarity will lead to positive (optimistic) or negative (pessimistic) cognitive styles (Peterson and Seligman, 1984; Peterson and Barrett, 1987). It is no surprise that attributions have a direct impact on emotion and affect because they relate to the causal structure of emotions such as guilt, pride, anger, shame, gratitude, pity and hopelessness (Weiner, 1985).

1.5.5 Dispositional traits (depression and anxiety)

The WHO estimates that, by 2020, depression will be second to cardiovascular disease in terms of a burden on the world (Murray and Lopez, 1998). Depression is described by WHO (2009) as "a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy and poor concentration".

Depression is one of the most debilitating and common psychiatric disorders (Beevers, Ryan and Miller 2003) that can affect 15% of all people at some point of their life (Drydan, 2004). Depression is currently estimated to affect about 121 million people worldwide, although it is reliably diagnosed and treated using medication and psychotherapy in most cases (WHO, 2009).

Although the treatment of depression has a high success rate, the risk of relapse remains an issue of concern. Indeed, Keller and colleagues (1983) indicated that 33% of people who had recovered from depression relapsed after only eight weeks following the completion of their treatment.

Another study by Paykel et al. (1995) showed that 50% of patients recovering from depression would experience at least one more subsequent episode of depression. Similarly, Kupfer (1991) reported that at least 50% of clients treated following their first episode of major depression would have at least one more episode of a depressive nature. Kupfer (1991) further argued that this risk of depressive relapse increased by up to 90% after the second or third episodes. More recently, Williams (2001) suggested that, in 50% of the cases treated for depression, the depression returns within two years following recovery while the risk of reoccurrence in this population is increased by 70%, which suggests a greater risk of relapse. Williams (2001) added that depression is a major contributor towards vulnerability for suicidal behaviours, which not only affects mood but also has an impact on memory. The risk of the early onset of depression (at or before 20 years of age) has been related to a highly increased vulnerability to relapse (Giles et al., 1989). This high risk would indicate that the earlier the onset of depression, the greater the vulnerability and the possibility of depressive episodes in the future.

Research conducted by the Mental Health Foundation identified that, while five million adults in the UK suffer with debilitating anxiety-based difficulties, only 25% of them have sought support compared to 90% for those seeking help with physical health problems. The 2009 Adult Psychiatric Morbidity Survey revealed that, between 1993 and 2007, the prevalence of generalised anxiety disorders had risen from 7.5% to 9.7% (WHO, 2009). Further increases in the same 14-year period have been reported in phobias (from 2.2% to 2.6%) and panic disorders (from 1% to 1.2 %). The Office of National Statistics Psychiatric Morbidity Report in 2001 identified the combined diagnosis of depression and anxiety as the most common mental health disorder in Britain with almost 9% of people meeting the diagnostic criteria. Numerous studies have considered the relationship between anxiety, stress and psychological wellbeing (Wells, 2001), while their impact at an organisational and operational level has been addressed through the development of stress management strategies at work. These strategies have been successful at some level in improving the psychological wellbeing of individuals. Recent publications have put forward evidence for the efficacy of specific types of intervention in addressing the needs of the client, such as CBT, mindfulness and meta-cognitive approaches.

1.6 Chapter summary: Theoretical conceptualisation

The associations between personality traits and characteristics have been examined by a number of researchers seeking a clearer understanding of the relational factors of these variables. A large body of evidence has suggested associations between the major personality traits (neuroticism, conscientiousness, extroversion, agreeableness and openness to experience) and coping behaviours, as well as strategies that lead to appropriate responses (O'Brien and Delongis, 1996). Other studies have also investigated the factors that contribute towards emotional regulatory or irregularity (Safren et al., 2000). These studies have highlighted common features associated with anxiety and depression that can be identified using the cognitive model of negative emotion. Additionally, the crucial role of personality traits, specifically neuroticism or dispositional negativity reported in research and practice (Smith and Dust, 2006) highlight its association with other measures of perceived coping such as problem-solving or building confidence. Similarly, personal characteristics may predispose an individual's mode of coping in some situations. This utility may instigate processes involved in the development of negative emotional responses such as low mood or anxiety related difficulties. The correlation between depression and information processing has been discussed by a number of researchers, namely Beck (1983), who suggested that cognitive or neurochemical factors are responsible for the depressive outcome. Central to Beck's theory (Beck, 1976; Clark and Beck, 1999) is the presence of negative thoughts about self, the world and the future, all of which would influence biased information processing and therefore be a contributory factor to emotional representation of depressive or anxious. There is also a significant amount of studies that have shown that depression is linked to a decrease in the efficacy of a broad range of cognitive processes (Burt et al., 1995; Nebes et al., 2000). For example, a study by Davey, Hampton, Farrell and Davidson (1992) reported that traits or states of anxiety are directly correlated to negative cognitive and behavioural coping strategies. Other factors such as self-esteem also show a direct correlation to anxiety and depression; in other words, higher levels of low self-esteem in an individual are more likely to produce beneficial problem-focused behaviours (Jerusalem and Schwarzer, 1989).

Different perspectives on emotional and cognitive processes have also been presented such as by Zajonc (1980), who argued that affect is at least partly independent of cognitive system, while cognitive system and affect usually function together but that affect could start without prior cognitive processing. Despite evidence to support the relationship between appraisals and emotional representations, many questions remain unanswered with reference to correlation and direct relationship between appraisals, coping and psychological wellbeing. The relationship between psychological wellbeing, emotional responses and cognitive process has been previously indicated that each emotional and cognitive response might trigger and produce a unique process when exposed to an external or internal cause. This, in turn, constructs a suitable platform for the interpretation of information and responding to stimuli accordingly. It is understood that the response is based on a set of values, motivation and meaning, which is either attached or created, in order to respond to the experienced stimuli and then reappraised.

This chapter has provided an overview of previous research as well as some of the shortfalls in research, while some of the key objectives still require further investigation and consideration. These investigations could include the exploration of cognitive and emotional processes and the role of Cognitive specifity (Beck, 1979). The investigation on stress and its association with coping mechanism or strategies utilised would highlight the coping characteristics and their relationship with appraisals. Furthermore, this could enhance the possibility in prediction of psychological wellbeing, and therefore establishing a better understanding between internal processes and psychological wellbeing. The cognitive and emotional processes as well as their relationship with psychological wellbeing have been investigated by number of researchers (Beck et al., 1979; Burt et al., 1995; McAllister, 1981; Miller, 1975, Nebes et al., 2000; Segal et al., 2002 and 2013). However, the role of the cognition and its sublevel processes as predictors of psychological wellbeing remains unclear. This study aims to consider and target specific sets of measures where the emotional distress could be predicted. The next chapter will put forward a framework through which the previous findings will be examined together with the consideration and development of a research method where specific measures are identified in order to predict psychological wellbeing.

Chapter Two: Development of the Research Framework

2.1 Overview of research framework

The first chapter provided an overview of the previous theoretical and topical studies in relation to cognition and emotion. There were also discussion around variables and features such as attribution, personality characteristics, coping and control, together with their relationship to psychological wellbeing. In addition, several key areas for further research were identified, which remain to be explored.

Although there are similarities amongst the theoretical explanation for the content of stress and symptomatic outcomes, the distinction between the theoretical propositions and models remains to be explored. The main concern is associated with the content of the processing and their proximity or priorities in recognition, identification, appraisals and reappraisals of the identified distress. Furthermore, the individual ability or strategies utilised to cope with the distress are dependent on specific variables such as considering individual's degree of control and their personality traits. The main issues of concern are associated with considering the content and processes in which the response to stressors are selected. The identification of such markers would offer a distinct opportunity to examine the potential for the predictability of stress where identifiable features could be noted and utilised in prediction of psychological wellbeing.

Therefore the current research project aims to investigate the predictable qualities of cognitive measures in developing a suitable preventative approaches to psychological distress. In order to develop a framework for undertaking this investigation an overall design of the study was considered and adhered to as shown in fig.2.1 that has provided the basis and an overview of this thesis in advance of undertaking the research.

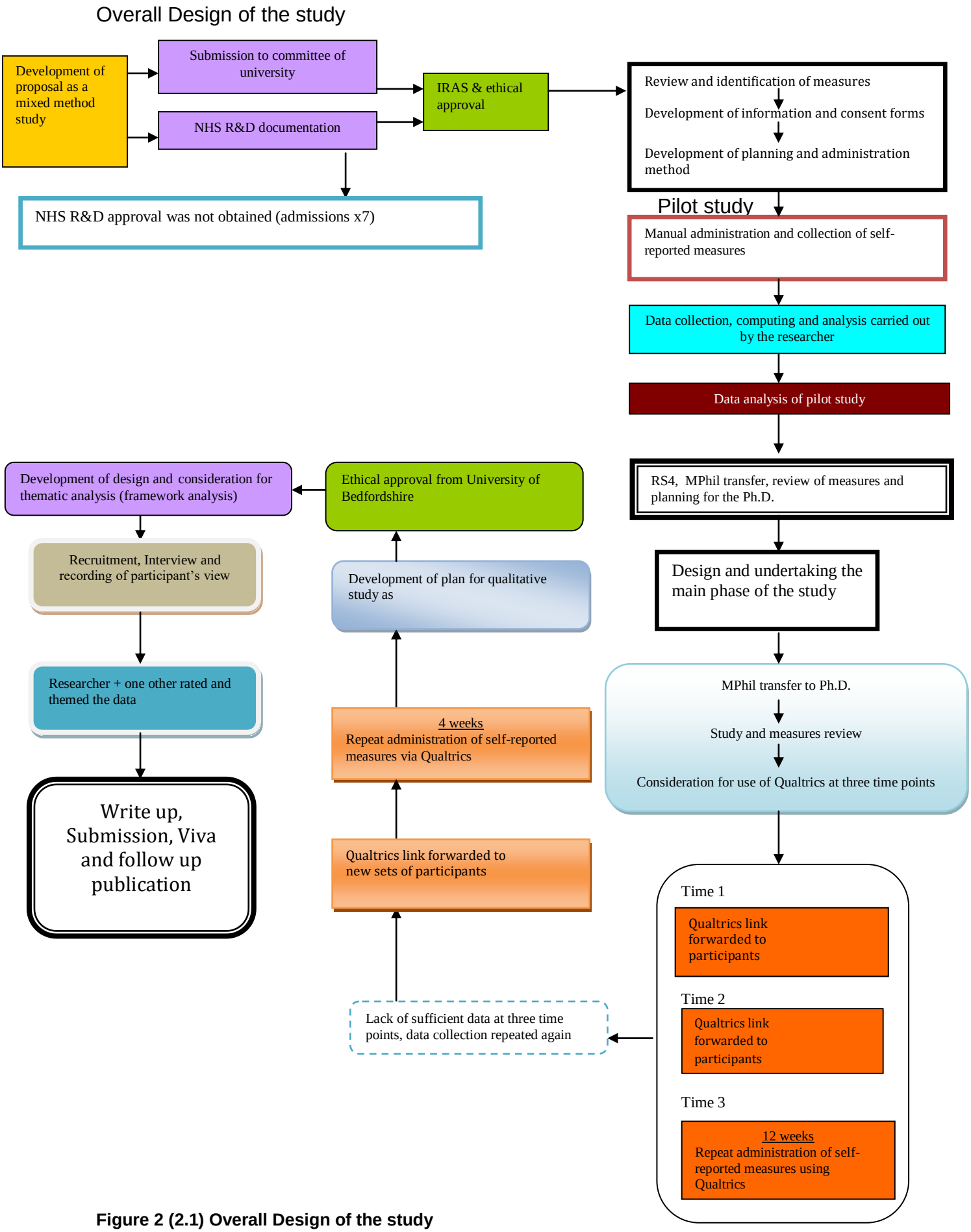


Figure 2 (2.1) Overall Design of the study

2.2 Development of the research Framework

In recent years, advances in research have been helpful in providing an evidence-based theoretical framework in clinical practice. A number of studies have drawn attention to evidence-based approaches, such as Cognitive Behavioural Therapy (CBT) and Mindfulness-Based Cognitive Therapy (MBCT), both of which are also endorsed by the National Institute of Health and Clinical Excellence (NICE, 2011; 2015). The main intent of these approaches is to identify and change the focus in thought processes, or challenge an individual's current mode of thinking. This will enable the thought processes to be examined by the individual and, in turn, help them to address the cause of their psychological distress, such as low mood or anxiety.

A plethora of research has confirmed that depression is closely associated with cognitive processes (Burt et al., 1995; McAllister, 1981; Miller, 1975, Nebes et al., 2000). Likewise, there is copious research highlighting how clients continue to suffer with depressive presentation and relapses in depression. A lack of positive outcomes has been reported in spite of an evidence-based intervention while, in some cases, sufferers have been unable to fully recover or achieve a positive state of psychological wellbeing during their lifetime (Beck et al., 1979; Segal et al., 2002 and 2013).

There are various reasons that explain the lack of success, although this could partly be due to the fact that the aforementioned approaches attempt to address emotionally based difficulties or symptomatic issues in the absence of a clear understanding of cognitive processes and their effects in clinical practice.

One method that has been shown to result in the desired outcome is by assessing, in the first instance, an individual's cognitive markers, whose attributes directly correspond to their state of psychological wellbeing. This can be achieved by using a Dysfunctional Attitude Scale (DAS) or thinking style questionnaire. DAS was originally devised to identify and measure the degree and severity of negative attitudes in the thinking style of those with depression or low mood towards themselves, the outside world and the future (Beck and Wiessman, 1987). By asking 100 questions, DAS-100, as it is known, provides a reasonable method of examining the negative thinking style of an individual.

Dysfunctional Attitude Scale has since modified by Power et al. (1994) who reduced the scale to a 24-item version (known as DAS-24) without affecting its reliability and validity. Furthermore, the integrity of DAS-24 has been tested and applied in both non-clinical and clinical settings with bipolar and unipolar depressed client groups (Power et al., 1994; Farmer et al., 2001). Other dimensional features of previous investigations have shown the relationship between DAS-100, attributional biases and coping with low mood, as well indicating the correlation with depressive presentation and relapse (Beck et al., 1979 and Teasdale, 1988). In addition, the correlation between cognitive processes of stress and control, which was discussed in the previous chapter, has shown to have a close relational feature. Nevertheless, we still have a limited understanding of their inter-relational correlations and how these could be utilised to predict psychological wellbeing. There have been 14 research publications predicting the relationship between dysfunctional attitude and psychological wellbeing during the last decade. Moreover, evidence-based approaches have been helpful in reducing and managing some symptoms of depression and anxiety. However, further modifications are required, both theoretically and in treatment approaches, which lean towards a prevention rather than intervention and transformation of the treatment-based (reactive) approach.

This study aims to examine the relationship between these dispositional indicators and psychological wellbeing, in order to develop a greater understanding of causal link and the correlation with psychological wellbeing. To develop a clear hypothesis, however, further investigation of dispositional features is needed to clarify the rationale behind developing such themes and subsequent developments in the research framework of this study.

2.2 Theoretical rationale of dispositional features

The notion of depressive realism was examined and discussed by Taylor and Brown (1994) in their argument that positive illusions promote psychological wellbeing. They concluded that negative or positive biased attribution could lead to an indirect association with depression.

Similarly, affiliation of biased attention has been explored as a mode of intervention in MBCT in terms of three specific dimensions; attentional control, disengagement from judgement and noticing or observing the judgement.

In reviewing the evidence-based approach of CBT, Hollon et al. (2006) referred to two differential modes of effects: treatment effects, which can be identified as factors that moderate problems. Although, this approach remains resistant in the absence of a prescribed intervention, while the intervention may also require a restorative approach in order to resolve the underlying negatively-based processes. Secondly, preventative effects, which decrease the reliability of an intervention to reduce the risk of relapse in the future. The importance of the distinction between these two effects is the suggestion that there are multiple levels to processes as well as their relationship to and interaction with other cognitive levels and their emotional counterparts. Teasdale (1999) discussed modes of mind and relational association between emotional disorder and depression.

Similarly, Beck's Cognitive Specifity Theory (Beck et al., 1987; Beck and Perkins, 2001) comes into the equation (because each emotional response is associated with a specific set of cognitive processes) by instigating a thought that produces a set of specific parameters that could be recognised and processed, even though there are multiple level processes communicating at the cognitive and emotional level.

Teasdale (1999) also described Cognitive Reactivity (CR), which is defined as triggering a multi-level cognitive process in response to an emotional cause. This could suggest that there is further potential for the recognition of such patterns, thereby offering an opportunity for the assessment of predictability towards vulnerability and the risk of future relapse. Meanwhile, Fresco et al.'s (2007) study of mindfulness-based CBT concluded that observing thoughts could enable an individual to recover from major depression.

This method of observation can also protect individuals against relapse, although it has been reported that the levels of scores in the measurement of DAS dropped irrespective of treatment modality, suggesting that there are other underlying features of full recovery from a depressive state.

Gemar et al. (2001) referred to self-schema model of depression, in which they proposed that previously depressed individuals maintain a negatively biased depressogenic cognitive structure, adding that these processes are activated when an individual is fronted with a specific condition of negatively based affect. Derakhshan and Eysneck (2010) reviewed a number of studies relating to attention, memory function and symptoms of anxiety and depression. They concluded that anxiety and depression impair shifting functions of attention, although positive emotional states enhance the same process. Other findings include the impact of motivational intensity as the driver of cognitive and attentional processes. In predicting the risk of relapse, Oei and Shuttlewood (1997) found that specific processes were more strongly correlated with reduction of depressive symptoms than were common factors. It is noteworthy that the link between common factors in depression and specific factors was instigated because it could be targeted with the assessment of subscales and individual items markers.

The link between anxiety and depression is inherent and their interrelated nature has been demonstrated in number of both clinical and nonclinical studies (Clark and Watson, 1991; Costa and McCrae, 1992; Lamberton and Oei, 2006) where self-reported measures were utilised. As Pavot and Diener (1993) argued, the use of self-reported measures is questionable because they can consciously distort responses if they are encouraged. Gemar et al. (2001) also referred to the potential for distortion, especially when the measures are re-administered as part of the same experimental and scientific study.

Beck's 1976 model of cognitive content specifity hypothesis was one of the key drivers in the development of a more focused association with specific psychological disorders, where differences in cognitive content between anxiety and depression are observable (Lamberton and Oei, 2006), although the support for this model of specifity is limited. Moreover, Aaron Beck theorised that negative cognition is associated with depression and initiated by cognition about self and dysfunctional attitudes (Folkman and Lazarus, 1986).

Although depression can be an outcome of cognitive vulnerability, a lack of skills in coping with the stresses of daily exposure should also be considered; both theories are supported by number of empirical studies. Cognitive vulnerability is noted when negatively biased processing is initiated and uncorrected following a reflective process (Beevers, 2004).

According to Beevers (2004) a dual model process considers both associative mode and reflective processing. This duality is slow in relation to reflective processing and effortful in terms of processing the acquired information. The value of the information is processed at conscious level, whereas the reflective mode simply follows the symbolic mode that is developed from social or individual processing. This distinction may suggest further complication in identifying their mode of operation, be it independent, simultaneous or sequential. The link between reflective processing and life stress is notably similar to the process of meta-cognition, in which individuals try to suppress a cognitive bias leading to a negative thinking loop, thereby initiating a ruminative state and concurrent increase in depressive presentation.

John Teasdale and colleague (2002) reported that residual symptoms of depression were associated with less meta-cognitive awareness, adding that the treatment of depression using MBCT was associated with an increase in meta-cognitive awareness and a reduction of both symptoms and risk of relapse. Furthermore, a number of studies have highlighted the association between increased rumination and severity of depression (Nolen Hoeksema et al., 1997; Parker and Larson, 1994, cited in Beevers, 2004).

Other correlations have been reported the mediating relationship between negative attributional style, depressive vulnerability and rumination (Spasojevic and Ally, 2001). Coincidently, researchers in gerontology have identified that subjective wellbeing, which is derived from a complex construct and various dimensions, promotes health and longevity (Blazer and Hybels, 2004; Haewon Ju et al., 2013). Generally, people will consider using a meaning-focused approach as part of their coping strategies, which leads to options of either being restrained or reinforced in order to manage an experience of stress (Park and Folkman, 1997) and, therefore, seek a state of wellbeing.

Burns and Machin (2013) reflected on Coyne and Downey's (1991) hypothesis of a model of diathesis-stress, in turn proposing a comparative model of personal disposition and psychological functioning of individual. Furthermore, the proposed model included consideration of life strains and psychological predisposition within the social context in which an individual's physical and mental health could be observed (figure 2.1).

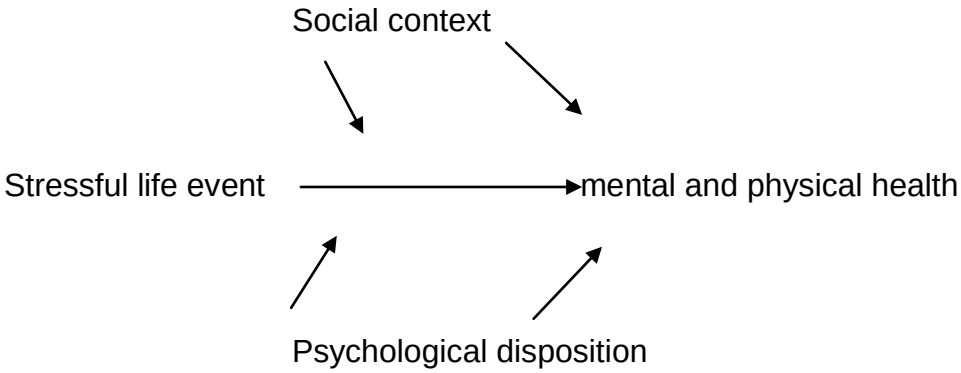


Figure 3 (2.2) **The diathesis-stress hypothesis proposed by Coyne and Downey (1991)**

Around 19% of the population aged 16 and over, which equates to around 1 in 5, have indicated some degree of anxiety and depression, with higher proportions for women (21%) compared to men (16%), particularly women aged between 40 and 59 years as well as 80 years and over (Beaumont and Lofts, 2013). Jarret et al. (2012) reported that Major Depressive Disorder (MDD) remains one of the main causes of disability worldwide, adding that MDD affects between 13% and 16% of population worldwide, while the risk of recurrence of MDD increases by 16% to 18% in spite of evidence based treatments such as Cognitive Therapy (CT).

Otto et al.'s (2007) study included an examination of the residual effects of depressive symptoms amongst 750 previously depressed female participants. They reported that DAS was able to provide marks for depressive and vulnerability presentations; although they acknowledged that there were differences in cognitive construct leading to vulnerability as well as considered that the different distinct pattern in the course of illness requires further investigation.

One mode of assessment may include the observation of dysphoric mood state, which is instigated by negatively based cognitive processing (Clark and Beck, 1999), and is taken from Bower's mood-memory state hypothesis (1981) suggesting that the processes of mood, cognition and attribution are interlinked. There are number of reported investigations testing such a hypothesis (Beck et al., 1961; Miranda et al., 1998; Van der Does, 2002; Westermann et al., 1996), cited in Jarret et al. (2012).

Teasdale et al. (2000) reported that the risk of relapse and recurrence of depression following treatment remains high, while citing Judd's (1997, P. 990) claimed that: 'unipolar major depressive disorder is a chronic, life long illness, where the risk of repeated episodes exceeds 80%, with patients experiencing at least 4 episodes on average lasting 20 weeks each'. The empirical evidence for CT in reduction of depressive relapse is limited, and it is clearly scrutinised (Teasdale et al., 2001) given the potential role for a cognitive mediator. Interestingly, John Teasdale and colleague argued that no evidence of effect from CT on DAS total scores or subscales of perfectionism was evident in the treatment of depression.

Although certain effects on the need for approval were noted (Imber et al., 1990; Teasdale et al., 2001; Segal, Gemar and Williams, 1999) reviewed DAS scores in a study where dysphoric mood was injected and found that they predicted ensuing relapse following a CT treatment, although there were limitations to their study, which included the sample size.

John Teasdale (1985) postulated that the perception of depressive presentation could be associated with uncontrollable rumination about depression, where CT functions as mediator in gaining control over perception of depression.

The Cognitive Therapy (CT) treatment of depression involves looking at the procedures in the mind where the focus is around awareness of negative thoughts and feelings (Moore, 1996; Teasdale et al., 1995; Teasdale et al., 2001), which could be reality-based or otherwise. Beck et al (1969) reported a structured method of disseminating the link between cognitive processes by extracting the negative automatic thought and its link to others cognitive biases.

This has been considered a cornerstone in cognitive therapy treatment in addressing depression and anxiety symptoms. Beevers et al. (2007) found that repeated incidents of major depression are directly associated with an increased level of negative cognition, which is more causative towards recovery. It is evident that stressful life events activate dysfunctional attitudes (Beck et al., 1979) leading to the onset of depressive symptoms. The main focus of CT includes changes in the manner of information processing in a depressive state, in which the automatic mode of processing becomes a more controlled mode (Teasdale et al., 2001) while changes in beliefs are considered as an initial method of relapse prevention. The process of priming automatic responses could be explained developmentally (Bargh, 1994; Devine, 1989; Gilbert, 1989; Harter, 1999), based on the two stages of the social cognition model, namely social inference and stereotyping.

The initial automated response is projected through a schematic reflective process that is subjected to a reappraisal and is likely to foster a mood state. The propagating depressogenic schematic processing is also considered as the mediator of subsequent negative reappraisals (Teasdale and Barnard, 1993; Teasdale, 1995) and, therefore, a marker for relapse in depression (cited in Teasdale et al., 2001).
The correlation between DAS and depression fits well with the diathesis–stress model of cognition, as proposed by Beck (1979), who inferred that early experiences make some individuals vulnerable to depression.

This early experiences continue to develop at later stages of life, especially when an individual is exposed to stressful life events (Grant, Mills, Mulhern and Short, 2004). This concept also fits well with Lazarus and Folkman's (1984) transactional model of stress, which represents a framework for appraisals and coping in line with psychological wellbeing. The original model suggests that vulnerability to depression is directly linked with underlying dysfunctional attitudes or assumptions. According to Beck (1979), CT aims to reduce these dysfunctional attitudes and assumptions and, by doing so, it is anticipated that an individual's thinking style will eventually return to a positive psychological state.

In recent years, third wave approaches to cognitive behavioural therapies have developed further. These include publications on MBCT and Acceptance and Commitment Therapy (ACT), both of which aim to address the shortfalls previously identified in the use of CBT by offering a different stance in dealing with dysfunctional attitudes and assumptions (Segal et al. 2002; Hayes et al., 2003), thereby exploring the cognitive processes in pursuit of a state of recovery. The original models of CT for depression and anxiety, respectively, do refer to an individual's sense of vulnerability and how this has a direct link to certain persistent dysfunctional attitudes. Teasdale (1988) presented the "differential activation hypothesis" suggesting that an individual's sad mood is reactivated by and correlated with thinking style. Similarly, in his exploration of the process of worrying, Adrian Wells (2008) highlighted the link with meta-cognitive processes in the relationship between anxiety and rumination and therefore.

In a recent publication on MBCT, Segal, Williams and Teasdale (2002) put forward a theoretical model that is based on a mental training approach and seeks to assist individuals in reducing cognitive vulnerability in emotional distress by relating this to the model of vulnerability.

Other theoretical explanations include Teasdale's (1997) discussion on cognitive subsystems, in which he suggested that perception or understanding of a concept, which is directly related to the different levels of cognition, is assimilated into a unified (holistic) conceptualisation which is meaningful to that individual. In addition, the deposited meaning is associated with different levels of cognition, namely implicational or propositional levels.

This assimilation of meaning may then offer the individual a set of perceptions and understandings from the information gathered through the cognitive subsystems. Furthermore, the impact on an individual could be interpreted in a specific format, which appears to have a correlative response to the individual's attitude, control and dependency. Studies (Teasdale, 1988; Segal, Williams and Teasdale, 2002) have shown that MBCT produces a good result in the treatment of low mood and anxiety-based disorders by increasing the positive state of wellbeing.

Another recent theoretical approach to depression is called ACT that has been considered as third wave of Cognitive Behavioural. ACT takes a similar stance in dealing with negative thoughts, where the focus of the model relates to psychological inflexibility. Based on the Relational Frame Theory (RFT) (Hayes et al., 2001), which focuses on the basic behavioural principles of human language and cognition. ACT targets six core processes that are designed to build psychological flexibility in order to help an individual cope with their negative thought processes (Louma, Hayes and Wasler, 2007).

These core processes refer to self-knowledge in relation to acceptance, cognitive fusion, being present, self-as-context, values and committed action. In other words, this approach seeks to help individuals gain an understanding and resolve problems by exploring the dynamics of these concepts and their interactions, so that they eventually come to an acceptance of their negative thoughts.

2.3 Appraisals

The threat experienced when exposed to an external strain is determined by the recognition of the meaning attached to the event (Lazarus, 1966); for example, the same experience may be considered by one person as innocuous, while another may considered it as highly threatening. The process of making sense of the experience is dependent on cognitive appraisal and the perception of the individual concerned.

Theoretical models of emotional regulation are constructed in two broad senses: antecedent-focused models, which are utilised as part of any preventative measure where an individual considers an emotional response and changes in behaviour; and response-focused models, which are utilised following the activation of an emotional response.

They both correlate with reappraisal and suppression of emotion in order to manage the emotional charge (Gross and John. 2003). This could initiate a number of emotional responses as mediators in order to modify the identified distress (Appendix 5).

It has also been suggested that, within each model, there are five specific sets of emotionally generated processes: selection of situation, modification of situation, deployment of attention, change of cognition and modulation of experiential, behaviour and physiological responses.

Gross and John (2003) described that, in relation to the model of emotional regulation, reappraisal would endorse psychological wellbeing as well as have a direct impact on the depressive symptoms and associated emotional states. The Automatic Thought Questionnaire is a reliable tool in the assessment of negative thoughts associated with self-concept, low self-esteem and hopelessness (Hollon and Kendall, 1980). Unfortunately, this questionnaire does not facilitate a measurement on frequency or levels of negative thoughts and, therefore, it is unsuitable for inclusion in this study.

In summary, there are a number of theoretical explanations supporting the importance of cognitive processes and its subsystem levels, which in theory could provide predictors of vulnerability to depression and anxiety, as well as the assessment of psychological wellbeing. Previous research and theoretical models have proposed a suitable level of supportive interventions for treating symptoms of depression and anxiety. Nevertheless it will be of greater benefit to individuals, organisation and society if a method of identifying specific markers of psychological wellbeing for individuals were identified. This method could be considered essentially proactive and further developed for utilisation.

This study aims to consider the markers of wellbeing and bridging the gap by applying specific sets of measures in the assessment of vulnerability and psychological wellbeing. Any measure that could be used to predict levels of vulnerability and psychological wellbeing would be highly beneficial in dealing with an individual's distress and supporting them towards psychological wellbeing. It is important to indicate that, during this study, the focus will be given to appraisals that show the greatest relational features with dispositional characteristics.

In addition to the observed and measured relational features, state affectivity within an individual might also be predicted. It is relevant to indicate that other influential factors, such as developmental and early experiences, and biological and social factors, may also have an effect on dispositional appraisal. However, the latter aspects remain outside the scope of this study. The correlation between affective responses and cognitive measures are proportionate to other variables.

For example, the interaction between mastery and negative affectivity has been shown to correlate with other variables, such as coping and management of the perceived demands. An individual's ability to recognise and manage the perceived demands could initiate coping strategies that act as an attempt to return to a positive state of psychological wellbeing. Finally, in spite the notable importance of psychological wellbeing, this area remains one of the least researched areas of cognitive studies. Indeed, there is no known up-to-date study that has utilised DAS-24 in conjunction with ASQ and CCS-15, in which their predictive qualities relating to psychological wellbeing were examined.

2.4 Development of Ph.D. thesis

Thus far, the relational features of cognitive measures and psychological wellbeing have been discussed and investigated. In spite of a number of references to relational features, no study has yet considered a comprehensive use of cognitive measures and their predictability of psychological wellbeing. Jarrett et al.'s (2012) study examined cognitive reactivity, dysfunctional attitude and depressive relapse, indicating that depression affects between 13% and 16% of the global population worldwide and is, consequently, considered as one of the frontrunners of disability worldwide.

Furthermore, Jarrett et al. (2012) argue that there is no cure for depression, although they do recognise that treatment is available, such as CT, that can significantly reduce symptoms of depression while and reduction in risk of relapse was also noted. They further emphasised the importance of early recognition of an individual's risk of relapse or recurrence, which is characterised and understood by examining the individual's vulnerability.

It is noteworthy that Clark and Beck's (1999) cognitive theories of depression refer to the very same issue, where individual vulnerability, overvaluation of negativity and pessimistic assumptions about self, others and world are adopted. Jarrett et al. (2007) undertook an experiment with 750 female patients, some of whom were not seeking a CT-based intervention, compared to the others; however, after treatment with CT, 73.8% scored within the healthy range on the questionnaire, suggesting less negative cognitive processes after receiving CT.

In the summary of their findings, it was suggested that DAS may provide an adequate measurement of vulnerability, while also referring to cognitive content and processes where vulnerability may be differentiated in terms of patterns and the course of developing depressive illness. Although depressive disposition can be measured, negative cognitive processes remain hidden and may diminish during remission (Ingram, Miranda and Segal, 1998). Furthermore, a recent review of depression and dysfunctional attitude within the last decade has changed significantly, in which lending consideration to cognitive models tends to emphasise the form rather than the content of dysfunctional thinking (Segal et al. 2002). Other studies, meanwhile, suggest that an increase in the level of depression and risk of relapse are associated with the content of dysfunctional thinking (Beevers et al., 2003). This has highlighted the importance of considering the examination of sub-factors of DAS within the same context. Furthermore, Elkin et al. (2006) reported that most research in the field of psychotherapy outcomes has focused on the primary prediction of symptoms and reduction in individual functioning, as well as noted that there has been limited research into constructs of quality of life and subjective wellbeing. Meanwhile, it was also reported that the efficacy of treatment surely should consider the general sense of wellbeing and an individual's ability to cope when faced with difficulties.

In response to the acknowledged shortfall, Hollon et al. (2002) cited a recommendation made by the Psychosocial Intervention Development Work Group at the National Institute of Mental Health (NIMH): 'priority should be placed on encouraging investigators to evaluate other outcomes in addition to symptom reduction' (p. 623).

Moreover, Elkin et al. (2002) have suggested the use of an appropriate measure in gathering general functionality if an individual is concerned with their wellbeing. This reflects Gladis et al. (1999), who argued that approaches to measuring quality of life should not be based on pre- and post-status, but assessment of quality of life as a prognostic measure of moderating variable.

Furthermore, in recent years, the Department of Health has accepted that CBT is an evidence-based approach for treatment of depressive and anxiety-based disorders, with reliable efficacy in most cases (DOH, 2008, 2014). CBT can reduce symptoms of low mood and depression (Beck, Rush, Shaw and Emery, 1979) and is also effective for anxiety symptoms (Wells and Carter, 2001).

Reported shortfalls in the literature may be due to the fact that the actual characteristics of relapse are less defined (Segal, Pearson and Thase, 2003) and, therefore, a lack of appropriate targeted interventions for these characteristics could minimise the optimum outcome in the direction of psychological wellbeing. One explanation could be that the relationship between the lack of psychological wellbeing and dysfunctional attitude, as described by Segal et al. (2002), refers to the role of dysfunctional attitude and cognitive biases. Similarly, Beevers et al. (2003, 2007) explored and identified the relationship between the negative state of psychological wellbeing and the content of dysfunctional thought.

Gollon, Gortner and Dobson's (2006) study suggested that dysfunctional attitude does not have any relationship with low mood, although it did not consider the characteristics of cognitive levels and thinking style in relation to low mood specifically. Some studies in the past have attempted to address this gap, such as Beck, Epstein and Harrison (1983) who referred to the vulnerability that relates to underlying dysfunctional attitudes. Interestingly, Automatic Negative Thoughts Questionnaire (ATQ) was developed to assess self-statements of negatively based cognition that assesses and identifies the frequency of such statements (Hollan and Kendall, 1980).

Ingram et al. (2007) also looked at the content of cognitive processes, examining attributional style and biases amongst children and adolescents; that said, they were unable to utilise a specific explanation in the prediction of relapse and risk to psychological wellbeing. Although Ingram, Miranda and Segal (1998) previously argued that persistent relapse could not be caused by dysfunctional attitude and assumptions, this claim has been challenged by a number of researchers in recent times. For Peterson et al. (2007), however, the individual's ability to make use of appropriate information as well as their ability to adopt and adjust to a situation is of more significance. This would suggest that the perception of the event and the coping mechanism play a more prominent role in the prediction and management of psychological state. Furthermore, they argued that the thought biases are not of significant importance, unlike the cognitive processes that the individual utilises in approaching life events and situations.

Teasdale et al. (2001) also suggested that the use of DAS extends the ability in identifying the extreme relationship associated with low mood. In an earlier study by Segal, Gemar and Williams (1999), the sub-scores of DAS were identified as playing an important role that could be utilised in order to predict low mood, as well as relapse in general. It is clear that there have been some changes in understanding the mechanisms involved in depression and relapse. The gap within the research in this area is clear, together with the importance of our ability to predict psychological wellbeing. Therefore, this study is proposing to investigate whether DAS-24, in combination with measures of control, meta-cognitive awareness, cybernetic coping scale, attribution and personality trait, could be a useful tool in the prediction of psychological wellbeing.

2.5 Development of hypotheses

Past and recent publications in this area have provided a vast array of evidence in support of close proximal correlation between appraisals, metacognitive awareness, mastery, coping and attribution. The rationale for further confirmation of similar findings would be of no benefit to individual or society. However, consideration of these variables as predictors of psychological wellbeing could provide a new proposition. It is therefore suitable to consider a potential hypothesis that could be tested utilising such specific measures. It was therefore provisional hypotheses were considered that included;

- Use of cognitive measures of thinking style, Metacognitive awareness, mastery, coping and attribution predictor psychological wellbeing

2.6 Considering cognitive measures

The previous review of literature has highlighted sets of cognitive features that have shown to correlate with the psychological wellbeing. Therefore the findings were summed to the nominated sets of measures in offering a predictive quality.

2.6.1 Dysfunctional Attitude Scale

The association between depression and dysfunctional attitude has been supported by cognitive theories of depression, although the reactivity of DAS to depressive levels reported in the latest evidence highlights the trait-like factors of DAS, its score and levels of depression (Otto et al., 2007). DAS and depression also appear to have a reciprocal relationship in which an enduring depressive presentation emphasises the impact on DAS and its score.

Moreover, either by psychological or pharmacological means, reduction in DAS has been directly associated with reduction in symptoms of depression. Otto et al. (2007) cited previous studies of depressive value that were presented as residual scarring effect on DAS, elaborated further in particular on a study by Nolen-Hoeksema, Girgus and Seligman, (1992).

Nolen-Hoeksema et al. (1992) reported that the enduring effect on cognitive scarring is as a result of an enduring depressive attributional style, adding that this may account for one possible depressogenic cognitive style.

Otto et al. (2007) stated that dysfunctional attitudes simply refer to residual symptoms and the prediction of relapse, as well as change across episodes of depression; in turn, recovery could be evaluated using DAS as predictor of mood state which correlates with depression. They further proposed that incremental scores on DAS following a depressive episode could be an indicator of the risk of future relapse. John Teasdale (1988) commented on the depressive cognition and the level of dysfunctional thinking that may predict relapse, adding that it may also suggest trait markers of vulnerability.

In a study of inpatient depressed clients, Williams et al. (1990) found that patients who were admitted with major depression indicated higher scores on DAS after six weeks of admission compared to patients with lower score on DAS in the same timeframe. Similarly, cross sectional studies on depression and dysfunctional attitude have shown a clear association between DAS and depressive presentation (Dent and Teasdale, 1988; Weich et al., 2003; Williams et al., 1990).

Moreover, Dunkley et al. (2003) considered previous studies on the relationship between DAS and personality variables. The validity of the correlation between DAS and the five factors model of personality was examined in their study, which included 122 participants with a 24-month follow up, concluding that DAS perfectionism is an important variable and contributor of association, which suggests a direct correlation between the five factors model of personality and DAS perfectionism. Dysfunctional attitudes involve beliefs that are pessimistic, unrealistic and rigid in nature and, therefore, instigate a tendency towards the promotion of mood disorders (Wenzlaff et al., 2002); put another way, depression could be considered as a consequence of emotional distress. Reduction in the level of depressive symptoms is associated with a reduction in DAS and its subscales.

The importance of mental control and its link to attitude uncertainty cannot be underestimated (Wenzlaff et al., 2002); likewise, the impact of chronic thought suppression and its association with attitude uncertainty. Nevertheless, the self-motivation of an individual is vital in restoration of mood state and recovery from a depressive mood state.

Finally, the study by Segal and his colleagues (1999) examined the impact of negative beliefs and DAS with a 30-month follow-up, suggesting that dysphoria could predict future symptoms of depression when changes in cognitive processing is noted, which could be measured using DAS.

2.6.2 Control

Personal control or locus of control and personal mastery has been described in terms of beliefs or reflection of beliefs with reference to the level of influence an individual has over their environment and self (John and MacArthur, 1999). According to Rotter's (1966) Social Learning Theory, the 'locus of control' draws attention to the relationship between action and outcome.

Other theoretical positions include the two-process model of perceived control by (Rothbaum et al., 1982). This model highlights how there is primary control associated with motivation to feel and be in control, whereas secondary control is considered as more subtly based and associated with promoting control. A number of theoretical descriptions have referred to the importance of perception in association with control and, in turn, description of perceived control, such as personal constructs theories of powerlessness, self-efficacy and sense of coherence (Antonovsky, 1984; Bandura, 1977; Seeman, 1975) cited in John and MacArthur, 1999). Theoretical discussions may be summarised in terms of being concerned with personal control or beliefs of control, personal mastery with reference to self-efficacy, and the global assessment of an individual's needs. The main context includes the notion that control in its essence could be perceptually based. It is natural that control and mastery are closely associated with depressive symptoms (Gadalla, 2009) given that higher levels of social support and mastery are associated with less depressive symptoms.

Raes (2010) cited the research by Neff (2003, 2005) who was examining compassion, self-criticism and coping. The assessed correlation between mastery goals and performance goals, reported as mastery goals were more adaptive and linked to reduction in anxiety. Other psychological vulnerability variables may include avoidance that correlates with emotional distress, regulation and coping.

A study by Kashdan et al. (2006) examined Experiential Avoidance (EA) and its correlation with coping, emotion regulation and anxiety-related pathology. In this two-phased study, they examined the mediation of the effects of two emotional regulation strategies: suppression and reappraisal. Kashdan et al. (2006) found that cognitive reappraisals were less predictive of the quality of psychological experience when compared to EA.

They further stated that EA, as a method of suppression, is strongly correlated with impaired social engagement and psychological distress. The role of self-regulatory strategies, then, based on both coping and emotional regulation has been highlighted in research (Kashdan et al., 2006).

2.6.3 Neuroticism

Neuroticism or negative affectivity is inherent characteristics that have been demonstrated by Watson and Pennebaker (1989) to have a direct correlation with a number of cognitive and affective responses. They concluded that these relational variables in negative affectivity are a general trait that is associated with psychological and physical states, referring to the term ‘somatopsychic distress; Adding that the main concern now includes the process of identifying the underlying psycho-biological mechanisms. In response to this shortfall, Patrick et al. (2002) developed a multidimensional personality questionnaire (MPQ), which considers both the structural and lower order traits that are correlated with reference to both psychological and biological phenomena.

In Rafferty and Griffin's (2006) examination of a number of coping resources in their study of coping variables and control, they tested the correlation between coping and control in relation to change and uncertainty. They concluded that a low level of neuroticism could be considered as a coping resource in stressful situations.

Furthermore, Rafferty and Griffin's (2006) elaborated that individuals with high levels of neuroticism are likely to focus on associative levels of distress, instead of engaging in goal-directed behaviour. Diener et al. (2003) cited a meta-analytic review of Lucas and Fujiya (2000), in which they found that extraversion correlated 0.38 with positive affect at the zero order level, while association with positive affect correlated at 0.80 when diverse methods of measurement were used. In assessing the strength of correlation amongst the variables, they utilised Structural Equation Modelling (SEM) to observe the correlation between negative affect and neuroticism. However, they appear to have greatly simplified the link between personality traits and subjective wellbeing given that they were only concerned with two variables of extraversion and neuroticism.

For example, in their study they presented the notion that extraverts are slower in shifting their attention from rewarding stimuli and find association between their motives, relatedness and positive mood (Derryberry and Reed, 1994; Tamir et al., 2002). In contrast with introverts who achieve the same outcome when in a neutral or negative mood state (cited in Diener et al., 2003).

Huppert (2009) refers to personality and its predictability of emotional style in the process of stating that particular dimensions of personality, such as neuroticism, are associated with negative emotional processing, whereas extraversion traits or sociability are strongly associated with positive emotional processing.

Theories of personality and subjective wellbeing have mostly considered topics that contain the following three main features: baseline level of affective and cognitive wellbeing, emotional reactivity, and cognitive processing of emotional information (Diener et al., 2003). Negative affect is correlated with emotionality as well as considered as predisposition of low self-esteem.

Therefore, negative affect could be considered as a predictor of individual differences and emotional distress presented in the form of depression and/or anxiety. Meanwhile, Weiner (1985) referred to the perception of a distal stimulus that instigates the primary appraisal and is associated with primitive emotional responses, subsequently leading to primary triggering of a mechanism where secondary appraisal is initiated followed by evaluative-based processing. The evaluation of such processes could either enhance the emotional experience or reduce the emotional response. There are two main points to consider within this paradigm: firstly, the influence of primal responses, which are genetically based and associated with neuroticism and personality traits; and secondly, the overriding system of cognitive evaluation or appraisal, which interprets and evaluates the stimuli by considering a potential response.

In a simplified format, Weiner (1985) produced a cognitive-emotion process model, where the outcome is evaluated and divided into two formats of management (general positive or negative emotion, and causal attribution and dimensions), concluding that this will lead to a distinct emotional experience.

2.6.4 Meta-cognitive awareness

Meta-cognitive awareness is described as a cognitive set whereby an individual's negative thoughts and feelings are observed as mental events rather than inherent aspects of self (Teasdale et al., 2002). Meta-cognition originated in child psychology, which had experience of testing and examining reasoning and ability in cognitive developmental maturation (Corcoran and Segal, 2008) in order to show correlation with problem solving, maturation and mood congruency. It is important to note that there are two features within the phenomena, namely meta-cognitive awareness and meta-cognitive beliefs, both of which could either indicate a positive or negative stance.

For example, a negatively held belief (e.g., 'if a thought of my father dying entered my head') could drive the outcome of cognitive process, thereby initiating attention focus processing and leading to a positive or negative outcome. The outcome could be based on problem solving in response to anxiety, rumination about possible past events, or reappraisal of the current state of thoughts (awareness of consciousness).

Corcoran and Segal (2008) reported that studies differentiating between meta-cognitive beliefs and meta-cognitive awareness are unwarranted, suggesting that a detailed examination of these processes is required in order to validate previous studies and their findings. However, it is reasonable to assume that cognitive processes, such as rumination, affective reactivity and attention bias, are mood-state dependent. Any possible changes in cognitive processes and internal experiences are considered as core charge of cognitive processing, which is explored in CT (Ingram et al., 1986; Teasdale et al., 2002), and such change in meta-cognitive awareness is associated with the alleviation of vulnerability and emotionality.

The aim of the meta-cognitive approach is to develop a central viewpoint, which is based on an axis of a healthy state of being present and here as opposed to rumination and worry on either side of that axis. Rumination on negative processes leads to a negative stance and depressive symptomatology; likewise, a shift towards the worry axis could initiate an anxiety-based process with a similar negative cognitive construct but with a different set of symptomatology.

Meta-cognitive awareness appears to lead to the observation and notification of both processes and, therefore, enables an individual to remain central to their thoughts. Teasdale et al. (2002) discussed a reduction in DAS and vulnerability when meta-cognitive awareness was utilised with a group of depressed patients. Similar studies in clinical practice on worry and anxiety have shown the same outcomes (Wells, 2008) with similar changes in depression and ruminative processes. Other studies have shown that a decrease in the DAS score of patients recovering from depression indicates an increase in dysfunctional meta-cognition at the schematic level (Sheppard and Teasdale, 2004), in turn reducing access to a dysfunctional schematic outcome. They also further suggested that this mode of observation of negative cognitive pattern could enable an individual to control resource processing at a schematic level, concluding that reduction in negative thinking style could be achieved by an increase in the control of processing, reappraisal and accessibility to dysfunctional schemas.

Similarly, in reference to MBCT and CT interventions, Teasdale et al. (2002) argued that the absence of meta-cognitive monitoring is potentially liable to deteriorate the depressive mood state and therefore initiation of a mode monitoring and intervention is essential in order to reduce the underlying negative thinking style.

2.6.5 Attribution

The psychological explanation of attribution indicates that an individual attempts to distinguish between the potential cause and its effect of an experienced event or situation that could be either positive or negative in its notion (Abramson, Seligman and Teasdale, 1978; Peterson et al., 1982).

The components of attributions comprise three formats: personal, permanent and pervasive.

- Personal attribution: For Abramson, Seligman and Teasdale (1978), in reference to the main explanation for attribution, the individual sees themselves as the cause of the event and therefore, internalises the concept (such as thinking, 'I always make this mistake') and similarly, the possible external attributes (such as thinking, 'others made me make that mistake').

- Permanent attribution: An individual with this attribution considers the situation to be unchangeable, which may be more associated with a confirmatory association of information, such as 'I am always late' (Peterson et al., 1982).

- Pervasive attribution: This attributional position considers that the situation affects all aspects of one's life, which could be also considered as an overgeneralisation of an individual's cause and effect; for example, 'everything I do turns out to be a mistake' (Abramson et al., 1978; Hewitt et al., 2004; Peterson et al., 1982).

Heider (1958) set the foundations for the theory of attribution, highlighting that the distinction between internal and external attribution could be found in an individual's attempt to assess and explain causes of their actions and others. In internal attribution, an individual seeks to blame the self and considers the negative perception of self-evaluation. In contrast, external attribution considers external factors as the causal factor of affect.

Weiner's (1974; 1979) work introduced a second dimension of stability and a third dimension of controllability to this theory (Appendix 2). Abramson, Seligman and Teasdale (1978) introduced a three-dimensional model, which included internality, stability and Globality.

Abramson et al. (1978), meanwhile, argued that individuals who demonstrate negative characteristics of attribution towards internal, stable and global causes are likely to experience depressive symptomatology when exposed to negative events. For their part, Peterson et al. (1982) considered that depression is an outcome of an experience where causal effect may be based on internal or external attributions, resulting in a depressive state and concluding with impacts on value of self. This evaluation of self is further affected by stable or unstable attributes, which could provide a precursor of a longer lasting depressive episode. Otherwise, the bias attribute causes uncontrollability in an array of situations, which may lead to global attribution with a depressive outcome.

Alternatively, the confined attribution may instigate a depressive outcome that could be pervasive in nature. The concept of attributional style has been investigated, which has led to a plethora of research regarding the association between attribution and depression (Abramson et al., 1978, Hewitt et al., 2004; Peterson et al., 1982). In a report called *Achievement, Motivation and Emotion*, Weiner (1985) stated that attribution plays a major part in the causal structure of emotion and identified seven specific sets of effective response: pride (self-esteem), anger, pity, guilt, shame, gratitude and hopelessness (Appendix 5). A more recent discussion (Seligman, 1990) around attribution suggested that attributional style is acquired through development states and personality characteristics and considered in specific domains of optimistic and pessimistic explanatory style of attribution.

2.6.6 Cybernetic coping

Susan Folkman and Richard Lazarus (1980) developed a measure called “ways of coping”. This measure aimed to predict the coping thoughts and actions that people utilise when exposed to stress. This measure further modified and debated by number of researchers (Costa and McCrae, 1989; Folkman and Lazarus, 1985; Guppy and Weatherstone, 1997; Guppy et al., 2004; Katz and Guppy, Katz and Guppy, 1998; Rick and Guppy, 1994; O’Brien and Delongis, 1996; Pearlin and Schooler, 1978; Park and Adler, 2003). However, the main utility of this tool includes measurement of three general coping distinctions. These generalised coping styles are problem focused, emotion focused and relationship-focused coping.

For Carver et al. (1989), correlation between personality traits as well as other mediators of coping, such as emotional stability and appraisals, can be concluded. Pearlin and Schooler (1978) referred to coping as any response that is instigated to prevent, avoid or control emotional distress caused by external life strains. Furthermore, they described that modes of coping could be categorised into three main functions: responses to change the situation, responses to gain control, and control of stress after the impact has been noted. Coping is not a one-dimensional behaviour, in which a number of levels of processing, perception and behaviours are closely integrated and engaged in order to assists with the desired outcome.

Emotional wellbeing of an individual is maintained using sets of coping content and style, where more variety within an individual’s coping strategies is considered the more effective way to protect emotional and cognitive needs. O’Connor and O’Connor (2003) investigated the role of perfectionism and coping, theorising that changes in psychological wellbeing could be predicted by perfectionism while avoidance coping moderated the link between these variables. They concluded that the dimensions of perfectionism could predict hopelessness and psychological distress, whereby these relationships are moderated by the coping style of an individual. This coping style may be examined in terms of either specific response or general response to stress. The coping style enables the prediction of a response to be adopted in managing the psychological distress and its adjustment to a stressful life situation.

Park and Adler (2003) conducted a cross-sectional study on medical students by examining the correlations between student's psychological distress experienced and coping style adopted. Their findings indicated that coping style is directly related to state of psychological wellbeing.

Other variables, such as consciousness, are considered as coping resources that have an effect on responsibility, organisational ability and being thoughtful (Costa and McCrae, 1989) that are likely to be surmise in the personality dimension in order to manage the experience or change that individuals experience.

Coping responses may take three forms (O'Brein and Delongis, 1996): problem-, emotion- or relationship-focused. The responses associated with interpersonal or communal levels of stressor suggest a strong correlation between situational factors and problem- and relationship-focused modes of coping. It is noteworthy that O'Brein and Delongis (1996) proposed that the dimensions of personality, which include neuroticism, extraversion and openness to experience, agreeableness and conscientiousness, were closely associated with modes of coping. Number of studies explored the relationship between dysfunctional attitudes with depressive presentation (Esther de Graaf et al., 2009; and Moore et al., 2014; Senormanci et al., 2013).

Similarly, poor coping skills such as coping avoidance are also closely correlated with management of stress and risk of depression (Edwards and Baglioni, 1993; Guppy et al, 2004; Park and Adler, 2003).

2.7 Review of recent publications

A review of recent publications has been carried out of which five publications were identified as appropriate to the aims of this study. Moore et al. (2014) considered the factors structure of DAS form-A with (n=982) participants using SEM in support of the DAS form-A construct validity, demonstrating that a correlation existed with measures of depression and social interaction anxiety, as well as symptoms of obsessive compulsive disorder (OCD).

Moore et al. (2014) further argued that the use of DAS should be considered in the research and practice of CBT for clinicians who use the measures to assess progress in interventions and identify potential risks of relapse.

Marcinko et al. (2013) referred to the mediating role of dysfunctional attitudes and pathological narcissism, together with its association with depressive symptoms. This study concluded that there is a correlation between narcissism and dysfunctional perfectionism.

In a more recent study by Van Rijsbergen et al. (2015) individual's personality and cognitive vulnerability were tested utilising DAS, which indicated that personality pathology shows high levels of association with dysfunctional attitudes.

Meanwhile, Pearson et al.'s (2015) study, which included over 3,500 participants, examined the correlation between cognitive style and future-depressed mood in early adulthood and its correlation with global attribution. Their findings indicated that negative global attribution is closely marked by depression, while reduction of negative global attribution was found to be significant in the prevention of and intervention for depression.

Another recent publication by Yilmaz, Gencoz and Wells (2015) examined the contribution of meta-cognition to depressive symptoms and their co-morbid correlation with dispositional anxiety.

This study utilised DAS-24 and the scale to measure positive and negative beliefs within rumination. They concluded that DAS was able to predict depressive symptoms, adding that DAS subscales did not individually produce significant correlation. Furthermore, they stated that meta-cognition variables showed stronger correlations and contributed more with depressive presentation than DAS within the cognitive domain.

2.8 Chapter discussion

This chapter considered discussion on theoretical description of transactional model of stress and its association with content specific of appraisal and emotion. The theoretical rationale for considering dispositional features and their association with psychological wellbeing were explored, identifying the core features of thinking style, thought awareness, coping, mastery and attribution as well as personality traits. In order to explore the potential for these features and their predictive quality, specific sets of cognitive measures were considered in achieving the desired outcome. The fact that previous studies have shown a correlation between such measures and dispositional features of anxiety and depression made them suitable for their utility in this study.

In line with the aims of this study, a commensurate set of hypotheses was considered in addition to specific sets of measures. One of the measures considered is DAS-24, which produces a degree of reliability and validity that is comparable to the other lengthier DAS iterations but is also beneficial in terms of the time required to complete the questionnaire due to its reduced scale. Other measures considered include the shortened version of the cybernetic coping scale for similar reasons to that of selecting DAS-24.

The assessment of control was also considered as a significant contributor in the prediction of internal and external control; as such, a measure of personal control in general life ought to be considered.

In addition, meta-cognitive awareness, its relationship with levels of vulnerability and its positive correlation with dispositional features of anxiety and depression, as well as rumination and worry, are factors in finding a suitable measure to consider in line with the potential for a risk of relapse. Individual perceptual processing has been shown to have a direct influence on the processing of information, and consideration was, therefore, given to the using methods related to the attributional style of individuals.

It is noteworthy that the positive features of attribution show no correlation with features of depression and anxiety; in contrast, the negative attributional style shows direct correlation with biased perceptual processing.

As the review of papers has only considered negative attributional bias in order to assess negatively based attribution, this study has adopted such a method by considering only negatively based questions. A suitable measure of depression was considered, namely Beck's Depression Inventory Scale-II, which has demonstrated satisfactory validity and construct in the assessment of symptoms of depression. Additionally, ATQ was not utilised due to its limitation and lack of predictive quality as the measure is used to identify and assess automatic negative self-statements. Having considered all the previous studies and measures, consideration was given to development of the hypothesis and therefore a pilot study was considered and designed. The aim of the pilot study along with discussion around selection of measures is forwarded in the next chapter.

Chapter Three: The First Survey

3.1 Overview: Development of the pilot study

Previous chapters provided an overview of wellbeing and theoretical points associated with specific cognitive measures. The core of the discussion intended to merge the previously investigated research and current understanding of the relationship between cognition and emotion. Furthermore, the relationship between variables of cognition and emotion and their impact on one another could be understood or represented such as symptoms of depression. Although, there are current understanding of ongoing link between cognitive variables and emotional distress, research has been limited in considering all appropriate and associated variables. Moreover, the potential for utility of such variables and measures as predictors of psychological wellbeing has not been adequately tested. Therefore, development of an appropriate assessment tool could enhance the productivity; hence the challenge remains for all to find a more efficient and effective assessment tools that are current and could be applied with ease within any setting.

Consequently a number of theoretical explanations were examined and reviewed in developing a method to address the needs for reduction and management of low mood in general population. Therefore, determine an alternative method that could improve our current understanding and approach in assessment of psychological wellbeing. It is postulated that by utilising a set of measurements of thinking style (Dysfunctional Attitude Scale; DAS-24), attributional bias (Attributional Style Questionnaire-negative items), mastery (Control), Cybernetic Coping Scale (CCS-15), Beck Depression Inventory (BDI-II) and Meta-cognitive awareness the desired outcome will be achieved in assessing the state of psychological wellbeing associated with depression. This proposal aims to achieve these objectives by exploring the correlation and their inter item relationships between thinking style, attributional biases, control, coping and meta-cognitive awareness. The gathered data are anticipated to be a suitable predictor of subjective psychological wellbeing.

3.2 Rationale and aims of the pilot study project

Following a systematic review of previous research and models a theoretical proposition was considered. This proposal considered practical implications of contributing features towards psychological wellbeing. In order to offer a substantial examination of the proposal a number of aims were considered for the pilot study. This included the rationale for choice of measures utilised and their impact in relation to their predictive quality. The approach was based on the theoretical dispositions that have been reported in previous chapter, leading to the development of the hypotheses for this thesis as indicated here;

- To identify the predictive quality of DAS-24, attributional biases and coping in relation to low mood.
- To examine the predictive quality of DAS-24, attributional biases and coping as well as Meta-cognitive awareness in relation to psychological wellbeing.
- To examine whether DAS-24, attributional biases, coping and Meta-cognitive Awareness Scale are appropriate tools in prediction of psychological wellbeing.

In line with these hypotheses a study design was considered that has been labelled as design of study one shown in fig 3.1. This design demonstrates the developmental stages, progression and processes in achieving the desired outcome.

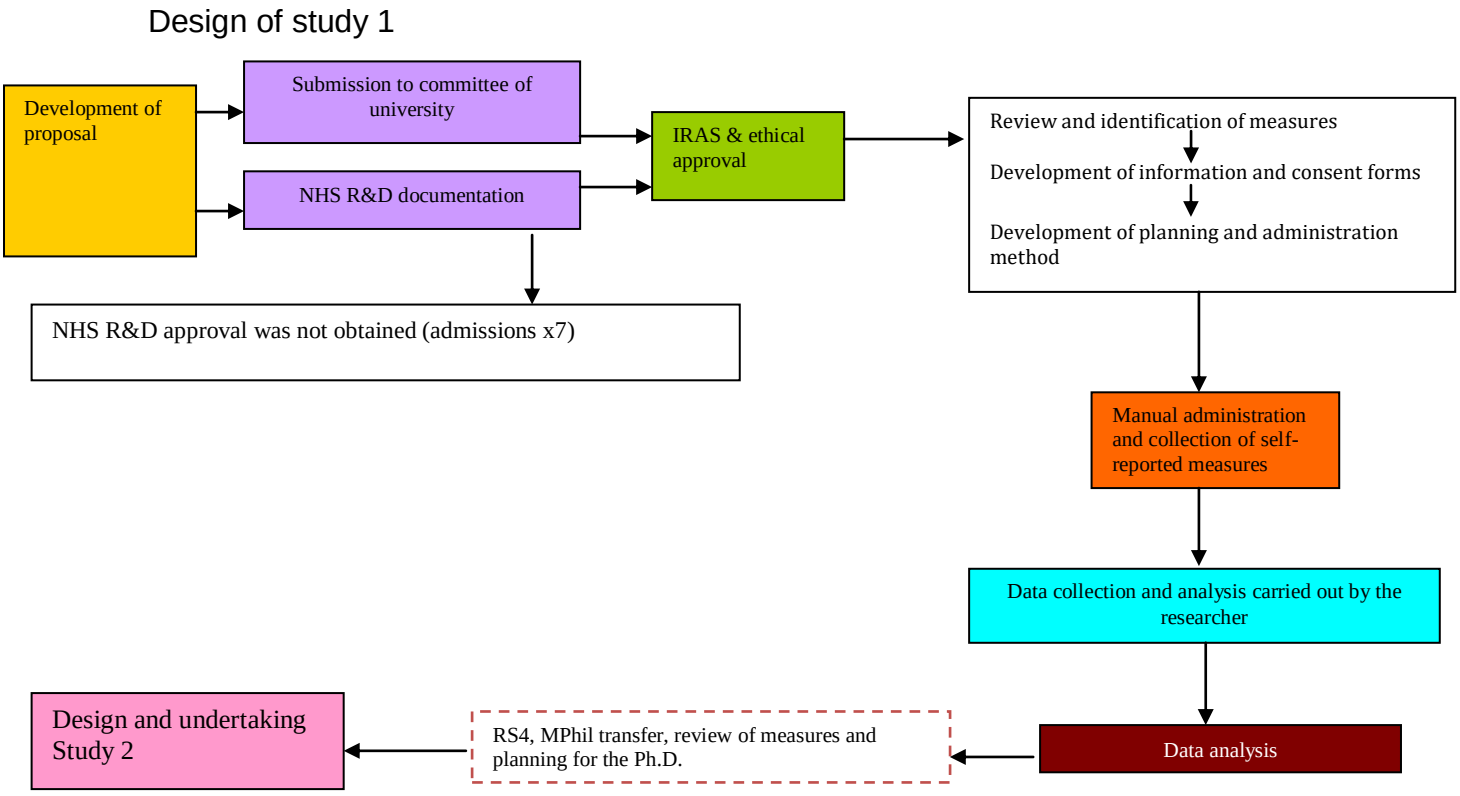


Figure 4 (3.1) Design of the pilot study

3.3 How the proposal will make an original contribution to knowledge

Development of a healthy nation has been a priority for the government and society at large. This view has been emphasised by national and social policies in relation to healthy living and psychological wellbeing of the general population. However, the main feature of addressing shortfalls in stress, low mood or anxiety management has not met the need appropriately. One potential approach considered, includes identification of a method whereby shortfalls in addressing public's psychological wellbeing needs are observed and met. The current resources are mostly set out to address difficulties at operational and organisational remain at the reactive level rather than proactively based approach. The need to address this shortfall is greater as the level of general stress increases due to work and personal life demands. Therefore, development of a suitable predictive measure could enable us to recognise and appropriately manage the difficulties in relation to psychological wellbeing. Systematic review of literature on 726 articles was carried out when dysfunctional attitude, DAS and psychological wellbeing were computed together producing 15 articles across decades of research spanning from the 1960's up to date. Systematic search on attribution, dysfunctional attitude and coping is produced two previous studies have considered similar methodology, although neither included the use of measures in considering their predictive qualities.

Furthermore, the two studies were carried out within the clinical settings, suggesting a further limitation of research in this area. None of the previous studies up to date have consideration such combination of measures in developing a theory to examine the predictive quality in relation to psychological wellbeing. One of more recent researches in this area Jarret et al (2012) refers to the cognitive processes and cognitive reactivity in relation to low mood and wellbeing. This study refers to cognitive processes as mediators of low mood and suggesting the importance of recognising the relationship between cognitive processes in relation to low mood. Similarly, Teasdale et al (2001) also suggested that the use of DAS extends the ability in identifying the extreme relationship associated with low mood.

In an earlier study by Segal, Gemar and Williams (1999) the sub scores of DAS were identified to play an important role which could be utilised as predictors of low mood, and relapse in general.

There are similar studies carried out in clinical practice where the relationship between these areas has been suggested, yet no research has provided a predictive explanation for their correlative relationship of these factors to psychological wellbeing. It is clear that there have been some changes in understanding the mechanisms involved in depression and relapse by previous studies, nevertheless the predictive aspects of low mood and anxiety in relation to psychological wellbeing is not examined.

Furthermore, this will enhance the importance of the ability to predict psychological well being by using the same methodology of assessing wellbeing. Recent reviews of research on dispositional psychological well-being has identified a number of theoretical stances, yet no research has attempted to draw a dispositional perspective from organisational cognition and attitude information processing, investigating their relationship to psychological wellbeing and life satisfaction. There are a number of studies focusing on symptoms and the approach undertaken in improving wellbeing.

Therefore, the proposal for this study is to investigate whether DAS-24 in combination with other measures could be a useful tool in the prediction of psychological wellbeing. This study will provide a clear link between the characteristics of cognitive processes and its subsystem levels of selected variables. Furthermore, suggesting that they could provide a suitable predictive measure of information processing in relation to psychological wellbeing. In addition, the relationship between these subsystem levels and symptom presentation could be explored. The dependent variable which was previously identified as a measurement of the BDI-II and independent variables as DAS-24, attribution, meta-cognitive awareness, mastery and coping.

Moreover, recent developments in therapeutic approaches such as Cognitive Behavioural Therapy, Mindfulness Based Cognitive Therapy, Acceptance and Commitment Therapy and Compassion Focused Therapy (CFT) have attempted to address this difficulty by recognising and addressing a symptomatic issue by using a cognitive based approach.

Similarly, government continues to offer support for Improving Access to Psychological Therapies (IAPT) initiated recently and continues to offer support for general public in England (NICE, 2009), yet supportive system remains reactive rather than proactive by considering a predictive or preventative approach.

A plethora of studies argued and offered their views in finding the solution to a suitable intervention, yet no previous studies, including a recent review of publications has considered utilising the combination of these cognitive measures as predictors of wellbeing. The fact remains that individuals are different in essence and therefore perceptual, cognitive and our response processes should be considered unique in nature. In spite this reality the researchers continue to develop more interventions rather than considering the primary understanding of an individual's needs.

A possible conclusion is considering individualised assessment of wellbeing, preferably at earlier stages of life and at least prior to any form of intervention as the current data suggests the intervention of evidenced-based approaches do not meet the need for a number of populations (Teasdale et al., 2002; Segal et al., 1999; NICE, 2009). The original design included consideration for inclusion of non-clinical and clinical participants as well as in both adult and adolescent population.

3.4 Method

3.4.1 Participants

Data from (n=147) participants were collected where a total of (n=127) provided full data set responses. The first and second year students provided the majority of the responses. There were female (n=99) respondent making 77.5% and male (n=28) respondents made the remaining 22.5% with overall average age of 44 years of age. The ethnic makeup of the participants ranged from Caucasian=83; Black=28 and Other Minorities=16. It is notable to indicate that there are distinction between female and male reported incidences of anxiety and depression that was mirrored in study and was comparable to previous studies (Bitsika, Sharpley and Melhem, 2010; Byram and Bilgel, 2008; Piccinelli and Wilkinson, 2000).

3.4.2 Measures

Following a number of reviews it was clear that the measures in thinking style, control, coping, symptomatic presentation and attribution were essential to consider with assessments of predicting one's state of wellbeing. The logical process for elimination offered six sets of measures listed as:

1) Dysfunctional Attitude Scale (DAS) was developed by Weissman and Beck, (1978) to assess dysfunctional attitudes, this was developed and shortened (DAS-24) by Power et al, (1994) maintaining the same reliability and validity in assessing cognitions. Dysfunctional attitude is commonly found in individuals predisposed to emotional irregularity, specifically depression (Marcus et al, 2001). Scores on DAS (24) range from 40 to 280, with higher scores indicating greater dysfunction, based on a seven Likert-type scale from totally disagree (1) to totally agree (7). The DAS show a good internal consistency (α =0. 85, Oliver and Baumgart, 1985) and test retest reliability (r = 0.84, Dobson and Breiter, 1983). DAS is one of the measures used in assessing depressive related beliefs. In more recent studies (Farmer et al., 2000, 2001) DAS-24 has been utilised as a measurement of choice in line with assessment of thinking style for adults with unipolar depression and also with adolescent depressed populations.

2) Personal Control (Mastery) was assessed amongst a non-clinical group of the population, this assessment, was able to identify a personal mastery or control that a person has over their life (Pearlin and Schooler, 1978) which has become one of the most widely used assessments in health research. This assessment was used to provide a basic representation of control, containing seven items answered on a four point scale, ranging from strongly agree (1) to strongly disagree (4). It has shown a reasonable internal reliability (Seeman, 1991) and good constructive validity (Pearlin et al, 1981). Use of measure of Mastery/Control provided evidence in line with the intent and ability to manage the perceived control a person has over their life and their drive towards psychological wellbeing. This measure also will be an indicator of the individual's ability to have control over their coping skills and manage their experienced difficulty.

3) Cybernetic Coping Scale (CCS-15) is used to assess the coping methods and coping strategies. Edwards (1992) developed the original version of CCS and later modified by Edwards and Baglioni (1993), which was based on the cybernetic theory of stress. The score ranging from “I do not use this (1) to ”I always use this (5). Guppy et al, (2004) revised and modified this measure in a multi-group factor analysis across four settings. The findings alpha coefficients >.70, its item loading ranged from .47 to .95 across all four groups, yield value of 31.11, df=21, p=. 05, producing an excellent validity for the 15 item version of Guppy et al, (2004). Correlation between Attribution, DAS and Coping has been a key factor in prediction of risk of relapse in depression (Edwards and Baglioni, 1993) and therefore a shortened version of coping scale has been selected with identical reliability and validity (Guppy et al, 2004) which would be easier to use by the participants.

4) Beck Depression Inventory (BDI-II) measure symptom severity of depression and was published in 1996 by Beck, Brown and Steer which has 21 items scored on a 4 point Likert scale from 0-3. BDI-II has shown good test retest reliability, yielding a coefficient alpha of 0.92 in an outpatient population indicated in the manual with internal consistency of 0.80 (Ames, Gatewood-Colwell and Kaczmarek, 1989). A study by Osman et al (2004) showed a good reliability and validity for its use of adolescent aged 13 and above with reliability estimation of 0.72 to 0.91 amongst the adolescent inpatient population.

5) Attributional Style Questionnaire (ASQ); The ASQ (Peterson et al., 1982) is a 12-item measure designed to evaluate the causal ascriptions that individuals use to explain the cause of positive and negative life events. The respondent generates one major cause for the event, and then rates the event on a 1-7 point Likert scale on the dimensions of internal, global, stability and controllability. The scores are distributed on each item scale, for example internally 1 totally my fault and 7 totally others fault. Validation of this measure has been documented (Levitan, Rector and Bagby, 1998).

Segal et al, (2002) acknowledged the relationship between attribution and depression, adding the distorted perception could be a contributor of negative thinking style, leading to depressive presentation. Furthermore, the correlation between depression, dysfunctional attitude and attribution has been noted by a number of researchers (Peterson et al, 1982; Levitan, Rector and Bagby, 1998; Teasdale et al, 2001). Negative components of the questionnaire are selected due to the length of the questionnaire and its direct link to depression, similar to study by Hewitt and Flett (2004).

6) Meta-cognitive Awareness Questionnaire (MAQ) is a 9 items questionnaire, which was devised for a study by Teasdale et al (2001) in assessing how the depressed client noted their depression and this was the actual reality. The scale is based on a 7point response based on a seven Likert-type scale from totally disagree (1) to totally agree (7) in similar format as DAS and shown to have a Cronbach's alpha for a period of 20 weeks in 139 samples as 0.71. The higher the MAQ score the greater the meta-cognitive awareness.

   Recent research has been reported the importance of meta-cognition in relation to depressive presentation has been highlighted (Wells, 2009) where rumination, thoughts about thoughts and awareness of such thoughts has been the investigation of relapse and therefore included this measure would enable the predictive quality in terms of rumination and risk of relapse combined with other identified measures.

3.4.3 Procedure

Systematic literature review was conducted, identifying 726 articles when specific words such as dysfunctional attitude scale combined with attributional bias and depression were computed. The addition of other criterion such as coping and control reduced the list of publications to 124 articles. From these studies only 15 articles included the combination of both dysfunctional attitude and psychological wellbeing. Only two studies have similarities in that the predictability of depression was considered using Dysfunctional Attitude Scale 24 items and these studies were conducted within the clinical settings. Thus far, no previous research had considered the use of combination of selected measures in the prediction of subjective psychological wellbeing.

Proposal documentation along with an ethics application form (RS1) was submitted to the ethical committee of the University of Bedfordshire. Integrated Research Approval System (IRAS) was completed and submitted. Meanwhile, applications for participants from the clinical settings were submitted on seven occasions to the Research and Development Department with two separate NHS trusts within the locality of the author. The application was declined by the ethical approval due to the task size of the task for one researcher. Therefore, a further ethical application was submitted for approval from the University of the Bedfordshire following an amendment by the inclusion of non-clinical participants being the main objective of this study.

In order to identify the numbers of participants required, a power calculation was carried out utilising Power Analysis and Sample Size (PASS) software. In order to accurately estimate the required strength of the relationship between variables based on Cohen's medium effect size (Cohen, 1990), the power of F-Test range of 0.8 and 0.9 would be showing the probability of effect.

This will be yielding an output (R-square) range of +/- 20% that would measure the strength of the relationship, suggesting a stronger relationship with closer estimation. Cohen (1988) suggested that for considering a large effect size an R^2=0.15 would produce a power effect in d value of 0.8. This would enable the possibility of estimating the relationship when factor variables are considered to examine the required for the sample size. This study considered the power calculation set at 0.8 with alpha level value of ($\alpha<0.001$), where the R-square at $r^2=0.25$ (Gecht el al, 2014; Lau et al, 2006) with 15 predictors, indicating a sample size of (n=112). The estimations from the power and sample size shown to provide a statistically significant effect size with minimum sample of (n=112) participants.

In addition, an estimated dropout rate was evaluated based on previous studies ranging from 20% to 50% at the follow up stages. Study by Gollan, Gortner and Dobson (2006) reported a 20% dropout rate in 24 months follow up with clinical participants and study Farmer et al., (2001) reported response rate of 50% with adolescent participants in 10.8 months follow up study. Based on a 12-month follow-up, a dropout rate of 25% was anticipated.

A sample size of (n=150) participants was considered for recruited to ensure a minimum of (n=112) participants for completion of the study. Following a discussion with supervisors, it was agreed to recruit a greater number of participants (n=300) in order to provide a suitable data sets and sufficient sample size for data analysis. An alteration in the design was adopted following the review by considering only non-clinical participants. The change in design and methodology was due to challenges in recruiting clinical participants. The correlations between measures of DAS-24 (Power et al, 1994), ASQ, CCS-15, BDI-II and MAQ have been examined. The research was further developed as a set of profile in the form of a pilot study with the view of developing the main phase of the study. The gathered data were computed for analysis of data by examining the correlations and regressions of items utilising SPSS (Statistical Package for the Social Sciences).

In addition, path analysis was conducted utilising Structural Equation Modelling (SEM). SEM provided a comprehensive method of testing correlations and the relationship between latent and observed variables. This method of analysis offered a better understanding of the pattern of correlations, leading to the development of a specified model (Hoyle, 1995; Kline, 1998; MacCallum and Austin, 2000).

As indicated previously a cross sectional sample of participants (n=147) was recruited from the Psychology Department of the University of Bedfordshire. Six sets of measures (Mastery, Meta-cognitive awareness, DAS-24, CCS-15, BDI-II and ASQ: 6 Negative items) were administered manually and data were collected. During the administration and collection some difficulties were observed, for example the lack of significant response rate and therefore alternative method was considered for the next phase of this study. The gathered data from the time one was uploaded to SPSS and analysed as part of the study one.

3.5 Data analysis and results

The manually administered questionnaires were collected, collated and computed using (Statistical Package for the Social Sciences) SPSS 19 and AMOS 20 (Analysis of Moment Structure) software for data analyses. The computed data was tested for the ratio of variability, regression and residual variability. In order to achieve the desired outcome ANOVA was utilised, also consideration was given to Listwise mode of analysis in order to assess the correlation of multi-variant. Twenty of the respondents had items missing on their responses that were considered incomplete and therefore they were excluded from the analysis. The analysis of data was carried out in two sections that included four stages of regression and correlation analysis. In addition, a further two phase path analysis was carried out that are represented next.

3.5.1 Stage 1: descriptive statistic of total scores for selected measures

This stage of analysis considered the test of significance of variance with each items and total correlation amongst the variables. The scale construct was internally reliable as expected and matched with the previous studies (Guppy et al, 2004; Hewitt and Flett., 2004; Osman et al., 2004; Pearlin et al, 1981; Power et al, 1994; Teasdale et al., 2001) producing an excellent Cronbach alpha with significant internal consistency value across all measures. As it can be seen in table 3.1 the descriptive statistics across both independent and dependent variables produced a significant Cronbach's alpha.

Table.1(3.1) Descriptive statistic of total scores

	Mean	Cronbach's α	SD
BDI	12.21	.904	8.93
Mastery	21.28	.684	2.86
Meta-Thought	39.50	.567	6.29
DAS-24	82.96	.811	17.04
ASQ	77.13	.744	13.76
Coping	45.17	.837	7.76

The BDI-II total score offered a Cronbach (α= .904) that mirrored previous findings in support of BDI-II reliability and validity (Beck, 1991). Similarity of scores for total DAS-24 and CCS-15 also offered an excellent Cronbach's (α=. 811) and (α=. 837) respectively. Mean scores across all indicated measures offered a standard deviation range of *SD*=2.86 with mastery to SD=17.04 with DAS-24 as shown in table 3.1.

3.5.2 Stage 2: Correlation coefficient scores

The next stage of this data analysis considered the strength and direction of correlation by testing the correlation coefficient amongst the identified variables. The correlation coefficient was conducted using the Pearson two-tailed correlation analysis. As shown in table 3.2 a positive correlation amongst the variables are reported. The significant correlation coefficient here suggested a good measure with the predictive quality of depressive symptoms. BDI-II also correlated with DAS-24, producing positive correlations similar to previous studies (Farmer et al., 2000, 2001).

Negative correlations were noted for BDI-II and independent variables of ASQ as well as DAS-24. One possible explanation for negative scores amongst these variables could be due to a paradoxical relationship, for example an increase in scores of DAS-24 would indicate a higher score on the BDI-II and therefore the reverse scores also is possible in absence of any low mood by active and effective thinking style.

Other examples could be seen in table 3.2 where lower meta-cognition score shown to have a higher correlation with BDI-II scores, that also could be internally correlated. Similar correlations amongst independent variables such as DAS-24 and ASQ were notable.

Table.2(3.2) Correlations coefficient scores

	BDI	Mastery	Meta-cog	DAS	ASQ
BDI	1.000				
Mastery	-.457	1.000			
Meta-co	-.367	.420	1.000		
DAS-24	.307	-.341	-.100	1.000	
ASQ	.303	-.127	-.109	.231	1.000
Coping	-.193	.116	.070	.021	-.175

The active correlation between these variables was tested using Pearson two-tailed correlation, producing a good variable significant across all measures. As predicted negative scores with measures of mastery and meta-cognitive awareness as well as an attributional style questionnaire were actively correlated.

3.5.3 Stage 3: correlation of predictability with BDI-II

The model summary is shown in table 3.3, reporting proportion of variance of depression with value correlation of (r=. 575) with proportion of variance of data standing at (r^2=. 303) suggesting an estimating 30% of probability of predictability of variables. Therefore, offering a good integrity for the prediction of BDI-II scores. Results in this analysis indicated that the F-value (F=14.414, df=5 and df=123, P.001) with 15 variables offered an overall significant value that supports the predictability of depressive symptoms.

Table.3 (3.3). Correlation of predictability for BDI-II

Model	*r*	r^2	Adjusted r^2	Std. Error of the Estimate
	.575[a]	.330	.303	7.46

Regression analysis of depression (*df=123, F=14.414, P<.000*)

3.5.4 Stage 4: multiple regression analysis

This stage included the multiple regression analysis of BDI-II as the dependent variable where a number of coefficient predictive values were tested. As it can be seen table 3.4 significant pattern of interaction emerged, including the mastery indicated value of (*p <.001*). Other variables did not produce significant values as expected such as Metacognitive Awareness (MAQ) with a value of (*p=.013*), DAS-24 (*p=.069*) and ASQ-6 scores offered a value of (*p=.015*).

This finding partially supported the previous studies indicating strong correlations between DAS-24 and ASQ with low mood (Framer et al, 2001, Hewitt et al, 2004). In addition, lower value scores noted for Coping with a value of (p=0.127) that was unexpected and therefore did not produce similar scores to previous studies on coping (Guppy et al., 2004).

Table.4 (3.4). Multiple regression analysis scores of the variables

	B	Std. Error	*β*	*t*	*P*
(Constant)	32.525	9.002		3.613	.000***
Mastery	-.880	.270	-.282	-3.258	.001***
Meta-cog	-.291	.116	-.205	-2.515	.013*
DAS	.078	.042	.148	1.836	.069
ASQ	.124	.050	.190	2.460	.015
Coping	-.134	.087	-.116	-1.535	.127

** = P<0.05, ** = P<0.01, *** = P<0.001*

As can be seen in table 3.4, coefficient correlation between independent variables and dependent variables of depression data extracted was constant with (β=32.52, t=3.61, p<0.001). The supporting evidence for the predictive quality of measures in this analysis was not adequate and therefore further analysis of regression was conducted in addressing the limitations. This was achieved by developing a theoretical model that was tested using SEM and path analysis.

3.5.5 Path analysis for prediction of BDI-II

Having considered and completed the regression analysis in the previous section, a structural equation modelling (SEM) approach was considered. As a first step, a series of confirmatory factor analyses were conducted in order to construct the latent variables to reflect the scales used within the regression analysis. The criteria for acceptable fit was set similar to Bentler and Hu (1999) and also Fan, Thompson and Wang (1999) by assessing the Root Mean Square Error of Approximation (RMSEA) at the cut off point close to 0.06 and for the Comparative Fit index (CFI) and Tucker-Lewis Index (TLI) a cut-off value was set at 0.95.

3.5.5.1 Phase 1: CFA for selected variables predicting BDI-II

In order to develop and examine an appropriate model that could meet the required outcome, first a set of confirmatory factor analyses of all variables was conducted. The main objective in this exercise was to examine the properties of the identified variables and their application within the analysis. As it can be seen in table 3.5 CFA of all the identified variables involved at this stage of the study were analysed and reported. The differences between properties of ASQ total score and ASQ sub factors provided an interesting reading as shown in table 3.5, interestingly the scores for coping five factors and coping total score also produced an intriguing read.

Table.5 (3.5) CFA for the selected variables

	Chisq / df	TLI	CFI	RMSEA
DAS total	.918/ 2	1.094	1.000	.000
ASQ	145.4 / 51	.687	.795	.092
ASQ3	168.8/114	.837	.878	.061
Mastery	20.4/13	.898	.937	.067
MAQ	43.1/25	.850	.896	.075
Coping 5	171.9 / 81	.808	.870	.072
Coping total	11.1/ 8	.965	.987	.056
BDI-II	2.06/1	.978	.996	.091

Further analyses of the variables were considered and completed that aimed to examine the correlations amongst the variables. Therefore a number of possible path analyses were considered and tested intending to explore the supporting evidence in relation to the hypotheses. Other approximations of weight regression were tested that also have shown to produce an interesting CFA scores, a summary of the analysis could be found in appendix 6.

Following the initial confirmatory factor analyses of measures, a simple bivariate path analysis of DAS total in prediction of BDI-II scores was performed. In table 3.6 a simplified version of weight regression has been demonstrated.

Table.6 (3.6). DAS total predicting BDI

Model			B	S.E.	C.R.	P	β
DAS total	⇨	BDI	.161	.044	3.644	***	.307

** = P<0.05, ** = P<0.01, *** = P<0.001*

Predicting = ⇨

Path diagram below shown in table 4 demonstrates the relationship between DAS-24 and BDI with their observed weight regression where the direction of correlation indicated for DAS in prediction of BDI-II.

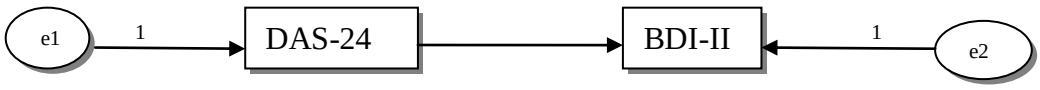


Figure 5 (3.2) DAS-24 predicting BDI-II

3.5.5.2 Path analysis for DAS, MAQ and Mastery in prediction of BDI-II

Further models were considered and tested with a range of combinations; this included the path analysis of DAS, MAQ, ASQ and Mastery predicting BDI as shown in table 3.7 below indicating values and scores of weight regression for DAS, meta-cognitive awareness, mastery and ASQ in prediction of BDI. Interestingly, Mastery with value of p<0.001 indicated the strongest correlation.

Table.7 (3.7). Path analysis for DAS, MAQ, ASQ and Mastery variables predicting BDI-II

			Estimate	S.E.	C.R.	P	β
DAS total	⇨	BDI	.071	.038	1.858	.063	.145
MAQ total	⇨	BDI	-.293	.104	-2.823	.005	-.220
Mastery total	⇨	BDI	-.926	.228	-4.068	***	-.317
ASQ total	⇨	BDI	.137	.047	2.900	.004	.226

** = P<0.05, ** = P<0.01, *** = P<0.001*

Predicting = ⇨

Other combinations were also tested as part of the path analyses that included coping total score as shown below in table 3.8 indicating a correlation amongst the variables, the highest value was noted with Mastery with value *P<0.001* indicating a direction correlation with depressive symptoms.

Table.8 (3.8). Bivariate analysis of DAS total and BDI-II

Model	Chisq / df	TLI	CFI	RMSEA
	49.003/ 6	.184	-	.237

This score suggests that the lack of control or belief in lack of control has a significant detrimental effect on depressive symptoms. The path diagram shown in figure 6 (3.3) indicates the variables of DAS-24, ASQ, MAQ, Mastery and Coping predicting BDI-II.

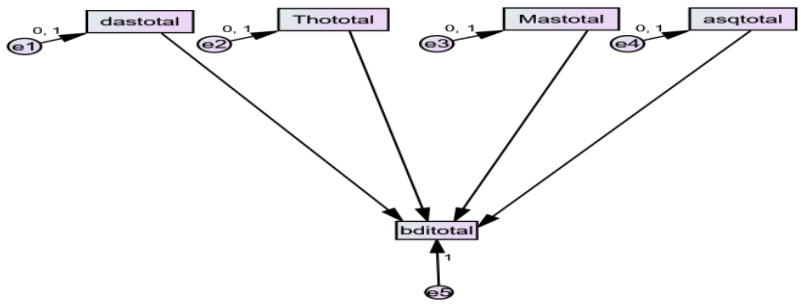


Figure 6 (3.3) DAS-24, ASQ, MAQ and Mastery predicting BDI-II

3.5.5.3 Path analysis for DAS, MAQ and Mastery, coping and BDI-II

As it can be seen in the path analysis shown in table 3.9, indicating that there were no CFI score, the absence of CFI score occurs when the data are missing and instead the Akaike Information Criterion (AIC) score was reported, additional regression information can be found in (appendix 6).

Table.9 (3.9) Path Analysis for DAS total, MAQ, ASQ, Mastery, coping and BDI-II

Model	Chisq / df	TLI	CFI	RMSEA	AIC
	49.0/ 6	-.171	-	.237	91.003

In spite notable correlations and affiliations amongst the variable the path analysis did not produce a significant score or fit with model in support of hypotheses. As it can be seen in table 3.10 bivariate analyses of variables in prediction of BDI was conducted with interesting findings, where Mastery again produced the greatest signifier in prediction of BDI with value of $p<0.001$, therefore suggesting a strong correlation between mastery and BDI.

3.5.5.4 Bivariant analysis of DAS, ASQ, MAQ, Mastery and coping predicting BDI-II

Other Bivariate analysis of variables in prediction of the BDI also produced an interesting findings, some of which deemed paradoxical in their predictability, suggesting an increase of positive score in one variable may have negative correlation with another variable as it can be seen in table 3.10.

Table.10 (3.10). Bivariate analysis DAS. ASQ, MAQ, Mastery and coping predicting BDI-II

			B	S.E.	C.R.	P	β
DAS total	⇨	Coping total	.049	.039	1.247	.212	.107
MAQ total	⇨	Coping total	.009	.106	.087	.931	.007
Mastery total	⇨	Coping total	.341	.233	1.461	.144	.125
ASQ total	⇨	Coping total	-.103	.049	-2.129	.033	-.182
DAS total	⇨	BDI	.078	.038	2.036	.042	.158
MAQ total	⇨	BDI	-.291	.103	-2.837	.005	-.219
Mastery total	⇨	BDI	-.880	.227	-3.873	***	-.302
ASQ total	⇨	BDI	.124	.048	2.587	.010	.203
Coping total	⇨	BDI	-.134	.085	-1.566	.117	-.125

** = P<0.05, ** = P<0.01, *** = P<0.001*

Predicting = ⇨

Path diagram indicating the indirect effect of coping shown in figure 7 below, as it can be seen, coping could have secondary impact on process and management of depressive episode.

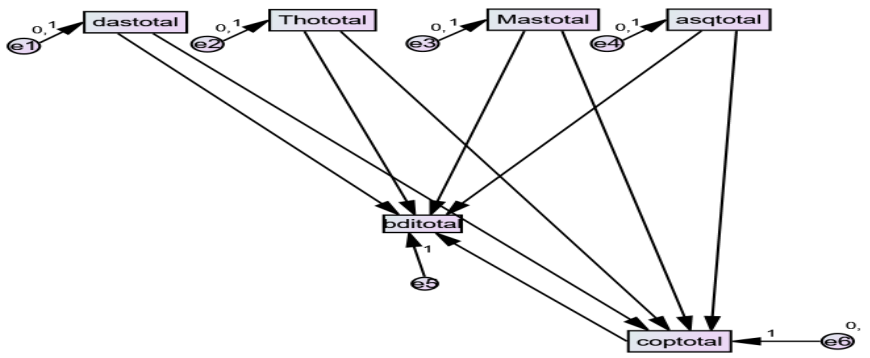


Figure 7 (3.4) DAS-24, ATQ, Mastery and ASQ predicting BDI-II and coping

3.5.5.5 Factor scores analysis with total and sub factors

Other analyses of models were conducted using factor scores with single coping factor as well as coping with its five sub factors. In addition, further analyses with three factor scores were conducted in order to test the integrity of the model.

In order to achieve the desired effect Oblique rotation analysis was performed to obtain a single DAS factor as shown in table 3.11 a model summary of confirmatory analysis without coping variable is represented.

Table.11 (3.11). Path Analysis without coping

Model	Chisq / df	TLI	CFI	RMSEA	AIC
	11.1/ 8	.965	.987	.056	65.164

Additionally, this analysis highlighted the correlations and covariance amongst all the identified variables as it can be seen below in table 3.12, and further information along with the path diagrams could be found in the appendix section. An approximation of 40% predictability of BDI was suggested in this analysis.

Furthermore, factor scores were tested on the identified variables as it can be seen in table 3.12, highlighting the covariance properties amongst variables.

Table.12 (3.12). Covariance factor scores (fx) for DAS, MAQ, ASQ and Mastery

			B	**S.E.**	**C.R.**	**P**	***B***
DAS fx	↔	Mastery fx	-.333	.093	-3.603	***	-.336
DAS fx	↔	MAQ fx	-.133	.088	-1.504	.133	-.134
Mastery fx	↔	MAQ fx	.410	.095	4.320	***	.413
DAS fx	↔	ASQ fx	.184	.082	2.251	.024	.203
Mastery fx	↔	ASQ fx	-.170	.082	-2.081	.037	-.187
MAQ fx	↔	ASQ fx	-.172	.082	-2.103	.035	-.189

** = P<0.05, ** = P<0.01, *** = P<0.001*

Covariance= ↔

Further factor score analyses were performed that included the sub factors of coping and as it can be seen in table 3.13 covariance between variables demonstrated a better score for weight regression across all variables.

3.5.5.6 Covariance factor score for independent variables

Notably, the covariance between thinking style and mastery suggested a paradoxical relationship between the two variables with significant value of *P<0.001*.

Table.13 (3.13). Covariance factors scores (fx) of independent variables

			B	S.E.	C.R.	*p*	***β***
DAS fx	↔	Mastery fx	-.333	.093	-3.603	***	-.336
DAS fx	↔	MAQ fx	-.133	.088	-1.504	.133	-.134
DAS fx	↔	Devaluation coping fx	.029	.088	.330	.741	.029
DAS fx	↔	Problem solving coping fx	.008	.088	.094	.925	.008
DAS fx	↔	Tension reduction coping fx	-.087	.088	-.991	.322	-.088
Mastery fx	↔	MAQ fx	.410	.095	4.320	***	.413
Mastery fx	↔	Devaluation coping fx	.021	.088	.240	.810	.021
Mastery fx	↔	Problem solving coping fx	.094	.088	1.069	.285	.095
Mastery fx	↔	Tension reduction coping fx	.169	.089	1.899	.058	.170
MAQ fx	↔	Devaluation coping fx	.118	.088	1.335	.182	.119
MAQ fx	↔	Problem solving coping fx	.170	.089	1.910	.056	.171
MAQ fx	↔	Tension reduction coping fx	-.156	.089	-1.752	.080	-.157
Devaluation coping fx	↔	Problem solving coping fx	.166	.089	1.870	.062	.168
Devaluation coping fx	↔	Tension reduction coping fx	.020	.088	.233	.816	.021
Problem solving coping fx	↔	Tension reduction coping fx	.070	.088	.792	.428	.070
DAS fx	↔	ASQ fx	.184	.082	2.251	.024	.203
Mastery fx	↔	ASQ fx	-.170	.082	-2.081	.037	-.187
MAQ fx	↔	ASQ fx	-.172	.082	-2.103	.035	-.189
Devaluation coping fx	↔	ASQ fx	-.079	.080	-.984	.325	-.087
Problem solving coping fx	↔	ASQ fx	-.151	.081	-1.864	.062	-.167
Tension reduction coping fx	↔	ASQ fx	-.119	.081	-1.477	.140	-.132

** = P<0.05, ** = P<0.01, *** = P<0.001*

Covariance and correlations= ↔

Added confirmatory factor analysis produced a better fit with the model with higher predictability of BDI scores, as it can be seen in table 3.14, although the Bayes Information Criterion (BIC) score was not available and instead Akaike Information Criterion (AIC) score was reported. An approximation of 43% predictability of BDI was suggested in this analysis.

Table.14 (3.14). Path Analysis scores with coping

Model	Chisq / df	TLI	CFI	RMSEA	AIC
	29.4/ 14	.965	.942	.093	131.48

An interesting observation included the lack of score across all confirmatory analysis for BIC, the absence of score for BIC was assumed to be due to the missing data sets, although the scores from AIC was able to provide a meaningful explanations.

These findings were taken further by developing a more comprehensive model where the data could be computed and analysed in support of the hypotheses. Although the reported analysis offered preliminary stages of developing a model an additional consideration in structure of model was considered and adopted leading to the phase two of this investigation.

This observation has been reflected on other study such as Oei, Bullbeck and Campell (2006) where the impact of moderator and mediators of depression and cognitive changes were examined. In their study the role of automatic thought and symptoms of depression were tested with three distinct models. This included automatic thought at pre and post therapy stages as mediators of change in cognition. The current study has considered the role of mediators and moderators and therefore following analysis and models have been developed and tested.

3.5.5.7 Phase 2: Path analysis and regression for predictability of BDI-II

Summary of the path analysis is shown in table 3.15 and as it can be seen following the score loading of each factor, the notable correlation was evident. The correlations in a number of variables shown below in table 3.15, including DAS-24 and mastery (*β=-330, p<0.001*), mastery and Coping Tension Reduction-CTR (*β=.313, p<.001*), Metacognitive Awareness (MAQ) predicting CTR (*β=-.308, p<.001*), Mastery and BDI-II (*β=-.289, p<.001*), all demonstrating the prediction of depression scores across a number of variables. In addition, the correlation between higher-order factors were analysed indicating both sub factor and total scores showed predictable quality.

Table.15 (3.15). Path analysis regression weight for predictability of BDI-II

			B	S.E.	C.R.	*p*	***β***
DAS	⇨	Mastery	-.055	.014	-3.864	***	-.330
ASQ	⇨	Mastery	-.011	.018	-.596	.551	-.051
DAS	⇨	Meta-cog	-.029	.033	-.879	.380	-.079
ASQ	⇨	Meta-cog	-.041	.041	-1.005	.315	-.090
Mastery	⇨	Coping accommodation	.043	.078	.549	.583	.053
Mastery	⇨	Coping devaluation	-.066	.098	-.677	.498	-.065
Mastery	⇨	Coping tension reduction	.283	.083	3.408	***	.313
Mastery	⇨	Coping avoidance	.017	.105	.159	.874	.015
Mastery	⇨	Coping problem focused	.008	.075	.105	.916	.010
Meta-cog	⇨	Coping accommodation	.048	.036	1.359	.174	.131
Meta-cog	⇨	Coping devaluation	.072	.045	1.619	.105	.156
Meta-cog	⇨	Coping tension reduction	-.127	.038	-3.362	***	-.308
Meta-cog	⇨	Coping avoidance	.017	.048	.364	.716	.035
Meta-cog	⇨	Coping problem focused	.021	.034	.609	.542	.059
DAS	⇨	BDI	.081	.040	2.015	.044	.154
ASQ	⇨	BDI	.124	.047	2.646	.008	.192
Mastery	⇨	BDI	-.900	.267	-3.369	***	-.289
Meta-cog	⇨	BDI	-.251	.117	-2.139	.032	-.177
Coping accommodation	⇨	BDI	-.631	.307	-2.058	.040	-.164
Coping devaluation	⇨	BDI	.098	.269	.363	.716	.032
Coping Tension reduction	⇨	BDI	.090	.259	.349	.727	.026
Coping avoidance	⇨	BDI	.033	.247	.134	.894	.011
Coping problem focused	⇨	BDI	-.508	.307	-1.656	.098	-.126

** = P<0.05, ** = P<0.01, *** = P<0.001*
Predicting= ⇨

Considering that lack of previously consensus regarding the factor structure in general, an exploratory analysis was conducted. This consideration was to assess the covariance and estimation of discrepancy between variables regression and their flexibility.

3.5.5.8 Phase 3: Path analysis and model summary for BDI-II

The correlation between predictability of measures in relation to the variable of depression (BDI-II) was examined, shown in table 3.16 that produced comparative fit index at the value of (*CFI=.966*, *p=.094*), Chi square CMIN (χ^2 *=16.216*, *df=10*, *RMR= .0419*) indicating an immediate measure of discrepancies as an excellent fit. Error of approximation was assessed by Root Mean Square Error of Approximation (*RMSEA=.070*) showing an acceptable fit and this was mirrored with goodness of fit at value of (*GFI=.977*), where Akaike Information Criterion indicating value of (*AIC= 106.216*) with Bayes Information Criterion (*BIC= 234.908*), offering an excellent model fit.

Table.16 (3.16). Path analysis and model summary

Model	χ^2	*df*	*p*	*CFI*	*RMSEA*	*AIC*	*RMR*	*BIC*
	16.216	10	.094	.966	.070	106.216	.0419	234.90

The hypothesised model was produced shown in figure 3.5 offers a correlative presentation of variables in their predictive position where the symptoms of depression could be predicted using identified sets of measures. The correlation suggests that DAS-24, Mastery, ASQ and MAQ predict dispositional depression. Moreover, these variables are correlated with coping strategies utilised an adopted in response to a stimulus that could be either internally or externally initiated. The hypothesised model could provide an explanation for their relational correlation and to be considered as predictor of other variables.

Hypothesised model of path analysis for BDI-II

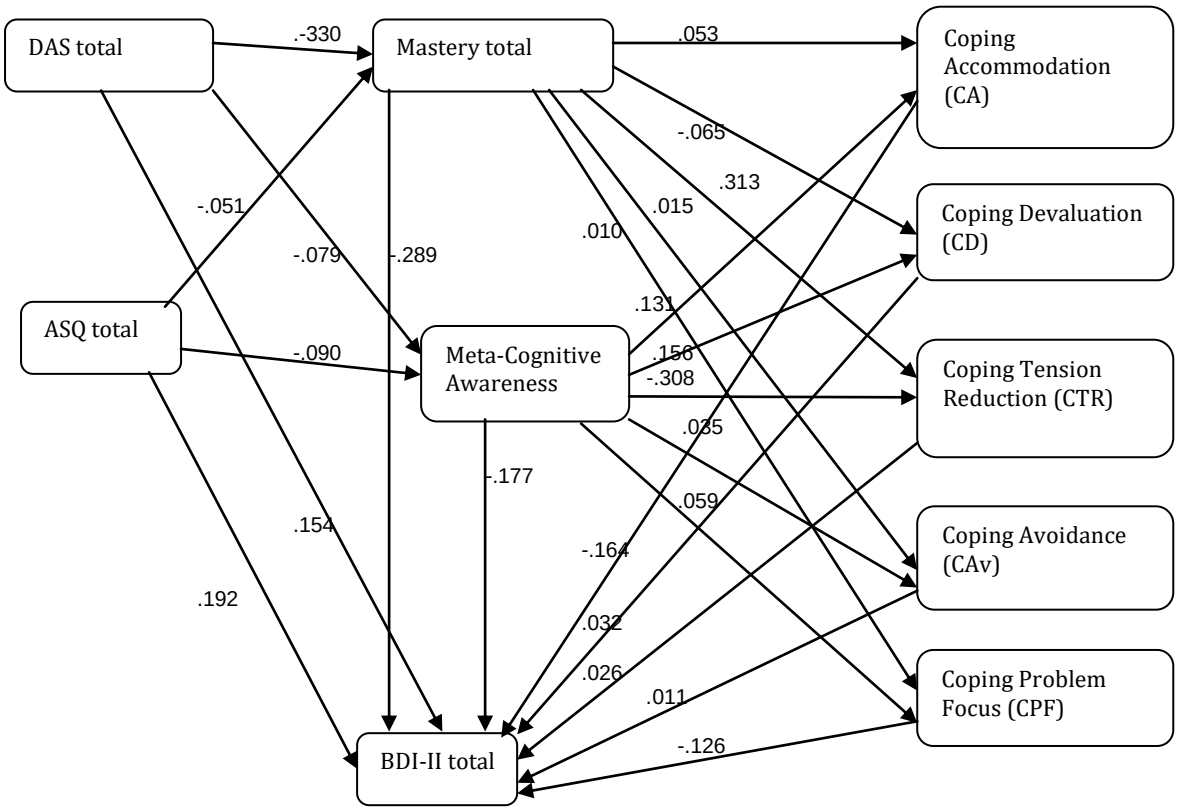


Figure 8 (3.5) Model for coefficient prediction of BDI-II

3.6 Chapter Summary: Results of study 1

This aim of this study was to examine the potential for correlation and regression between the identified measures including DAS-24, Mastery, Metacognitive awareness and coping in prediction of depressive symptoms. This study intended to examine the hypotheses where any changes could be considered prior to embarking on the main phase of the study. Following a systematic review of literature and selection of six suitable measures, a power calculation was performed. Participants (n=147) were recruited from the psychology department of University of Bedfordshire where data was manually collected and computed for analysis. A total of (n=127) data sets were considered as completed for analysis.

The demographic characteristics of the respondents included female (n=99) with 77.5% and male (n=28) respondent of 22.5% with overall average age of 44 years of age. The ethnic makeup of the participants included Caucasian=83; Black=28 and Other Minorities=16. The reported responses differed between male and female with female indicating a higher indices of anxiety and depression, interestingly, this finding was similar with the previous studies (Bitsika, Sharpley and Melhem, 2010; Byram and Bilgel, 2008; Piccinelli and Wilkinson, 2000). This could suggest a number of possible causes, namely female participants were less guarded about factual score of their thoughts and feelings compared to male.

Moreover, the factor analysis of measures and their utility were tested indicating an excellent Cronabcah alpha as predicted. The results showed a positive correlation between variables with the descriptive statistics data for total scores, for which there was an excellent Cronbach alpha at (α=*.904*) for BDI-II and also the weakest Cronbach alpha with value (α=*.567*) was noted for MAQ.

Correlation coefficient and regression analysis was conducted using ANOVA for the prediction of BDI-II scores. Finding in this analysis suggested that BDI-II correlated with DAS-24, producing positive correlations similar to previous studies (Farmer et al., 2000, 2001). The model summary shown in table 3.3 indicated value correlation of (r=. 575) and adjusted r squared value of (r^2=. 303) suggesting an estimation of 30% in prediction of BDI-II.

In addition, a series of path analysis was conducted in order to discriminate the best possible model where data was computed and tested. It is noteworthy to report that during the first phase of the path analysis, Mastery showed the strongest correlation with value of $p<0.001$ and covariance correlations between mastery and DAS total was also observed with the same value.

Other interesting observation included the lack of confirmatory scores for BIC with smaller models and also covariance correlations amongst the independent variables. The lack of score on BIC was considered to be due to the missing data and therefore additional regression and path analysis were conducted.

An added confirmatory analyses and factor score analyses were performed for all the identified variables with best results included coping sub factors shown in table 3.13, indicating covariances and demonstrating a better score of weight regression across all variables. Interestingly, the Bayes Information Criterion (BIC) score was not registered and instead Akaike Information Criterion (AIC) score was reported with an approximation of 43% predictability for depressive symptoms.

The current investigation adopted the bifactoral model with both the domain specific and the sub factors of the variables. This consideration was in line with the role of the bifactoral model that allows domain specific factors to be assessed independently of their general factorial position (Chen et al, 2006). The principles of reporting SEM data were adopted similar to Macdonald and Moon-Ho (2002).

Further path analysis examined the regression and correlation amongst greater number of variables by developing a more comprehensive model that could explain the potential correlation and support for the suggested predictive qualities of selected measures. Data was computed as part of the path analysis with interesting findings including DAS predicting Mastery, Mastery prediction coping tension reduction (sub factor), MAQ predicting Coping tension reduction and finally Mastery predicting BDI, all with value of $p<0.001$. Moreover, the path analysis model was an excellent fit with value of (*RMSEA=.070*; *GFI=.977*; *AIC= 106.216*; *BIC= 234.908*).

The results in this study were comparable with Hewitt et al., (2004) and suggesting a significant correlation between ASQ and BDI and unlike to study by Ilardi and Craighead, (1999) who reported no significant correlation between ASQ and BDI. In addition, results of coping did not produce a strong correlation with depression or anxiety, unlike previously reported studies (Rick and Guppy, 1994; Guppy et al., 2004).

In spite the reported results the BDI-II appeared limited in providing a suitable representation for the prediction of psychological wellbeing. Therefore amendments to the current use of measures were adopted. This was taken further following the discussion and feedback from the M. Phil transfer, consideration given to the use of suitable global measures.

Following a review and screening, two measures were considered (Patient Health Questionnaire PHQ-9 and General Anxiety Disorder GAD-7), which both have been utilised in IAPT toolkits (IAPT outcome toolkit 2008/9). Both measures have shown efficacy and internal consistency that matched the desired outcome and therefore replacing current measure of depressive symptoms BDI-II as the dependent variables. Another consideration following the pilot study included measuring the impact of recent events in relation to other variables by adding a single question to the questionnaire with reference to the current state of stress. Other insertions included the addition of neuroticism (negative affectivity) measure, which were deemed necessary and appropriate when considering the nature of the study.

Finally, the use of the manual collection of data has been effective, but the numbers in recruitment remains low. Following the discussion with my supervisors, the use of Qualtrics has been suggested and adapted to the plan of action. The questionnaires were modified, such that Qualtrics could upload the data for use. Discussion with supervisors led to consideration and administration of the questionnaires as part of the students' coursework where the participants could note minimal impact. Having considered changes within the measures, the main phase of study was initiated and reported next.

Chapter Four: Method and Results of the First Phase of Second Study

4.1Overview: Method and results for rational and aims of the study

The pilot study produced evidence for further developments and considerations in the utility of measures. In addition, other considerations were reviewed that included mode of administration of questionnaires and the utility of other resources. The identified shortfalls were noted and addressed and following reflection and review the required changes were made. The second study was initiated using a similar methodological approach along with additional sets of measures where the correlation and regression amongst the variables was tested. The main phase of this study was divided into three sections that included initial review and investigation of the previously tested hypothesis with (n=310) participant's responses. The identified number of completed data sets was considered to be suitable for regression and correlation analysis as well as path analysis. Although, a greater number of participants were expected, the completed responses did not match the desired intended number.

4.2. Rationale and aims

Following the review amendments were applied, these included a review of measures and administration of measures. One issue related to the suitability of the depressive measure (BDI-II), which was deemed limited in its utility. Therefore this measure was changed to a different measure of depression (Patient Health Questionnaire-9) PHQ9 and a measure of General Anxiety Disorder (GAD7), which offered a more global measure of psychological wellbeing. Furthermore, the hypotheses were reviewed and confirmed as below;

- To identify the predictive quality of DAS-24, attributional biases and coping in relation to low mood.
- To examine the predictive quality of DAS-24, attributional biases and coping as well as Meta-cognitive awareness in relation to psychological wellbeing.
- To examine whether DAS-24, attributional biases, coping and Meta-cognitive Awareness Scale are appropriate tools in prediction of psychological wellbeing.

4.3 Method

4.3.1 Participants of study 2

A cross sectional sample of non-clinical participants n=310 were recruited from the general population as well as students from the psychology department of Bedfordshire university. Participants ranged between 18 and 70 with mean average age of 35 that included (n=227) female with 78% of participants and male (n=76) 22%. Ethnic composition of the participants was divided into three categories for ease of use that included; Caucasian (n=254); Black (n=4) and other minorities (n=37). Following the review and changes in selected measures a total of eight measures chosen and uploaded into the Qualtrics system for dissemination and completion. Participants were invited to complete the eight sets of measures (Mastery, meta-cognitive awareness, DAS-24, CCS-15, PHQ9, GAD7 and ASQ: 6 Negative items and Neuroticism) where the data were collected simultaneously.

4.3.2 Consideration of additional measures

All previously utilised measures were included with the exception of the BDI-II, which was replaced with PHQ9 and GAD-7. In addition, as previously indicated the Neuroticism questionnaire was utilised within the main phase of the study.

The Patient Health Questionnaire (PHQ) is a self-reported measure was an instrument originally developed and validated in the early 1990s to efficiently diagnose common types of mental disorders presenting in medical populations. The instrument was designed as part of the PRIME-MD diagnostic instrument for common mental disorders (Kroenke et al, 2001; Spitzer et al, 1999).

The PHQ-9 is the scale for depression with criterion scores, range of 0 to 3. A score of 0 indicates 'not at all' and a score of 3 indicates 'nearly every day'. The PHQ-9 score can range from 0 to 27 indicating low at a score of ≥10 to severe level of depressive symptoms (Kroenke et al, 2001).

PHQ9 Cronbach's α=0.90 comapred with BDI-II Cronbach's α=0.95 where results were comparable, suggesting a good internal consistency with the item-total correlations ranged from 0.42 to 0.80 for the BDI-II and 0.45 to 0.83 for the PHQ-9, indicating a good item discrimination (Dum et al., 2008).

The Generalized Anxiety Disorder Scale-7 consists of 7 items that refers to features identified in the DSM-IV symptom criteria for generalized anxiety disorder (Spitzer et al, 2006). The questionnaire aims to examine how often individuals are affected by symptoms of anxiety within the last two weeks. The scoring ranges from 'not at all', 'several days', 'more than half the days' and 'nearly every day' and these are indicated in numerical terms of 0, 1, 2 and 3, respectively. Because each of the 7 items is scored from 0 to 3, the GAD-7 score ranging between 0 to 21 where scores of ≥10 representatives within a range value for identifying cases of GAD (Spitzer et al, 2006). GAD7 has shown an excellent Reliability and validity Cronbach's α=0.92, AUC: 0.91). Recent studies on GAD-7 has shown efficacy for screening other anxiety disorder.

4.3.3 Neuroticism and negative affectivity

Neuroticism or negative affectivity was considered to utilise within this study and in order to accommodate the demands on participant's time in addition to other utilised measures. The abbreviated twelve-item version of Eysencks Personality Inventory (1964) cited in Eysenck and Eysenck (1975) was utilised. All twelve items were rated on a four point Likert type scale ranging between 1 to 4 (1=Almost Never, 4=Almost Always) with the even numbered items corresponding to Eysencks Neuroticism scale and the odd numbered items corresponding to Eysencks Extroversion scale. Neuroticism scale has shown to demonstrate excellent internal consistency with ranged Cronbach's *α=0.84* to *α=0.89* (Nelson et al, 1996; Walsh et al, 1997) respectively.

Design of the main study

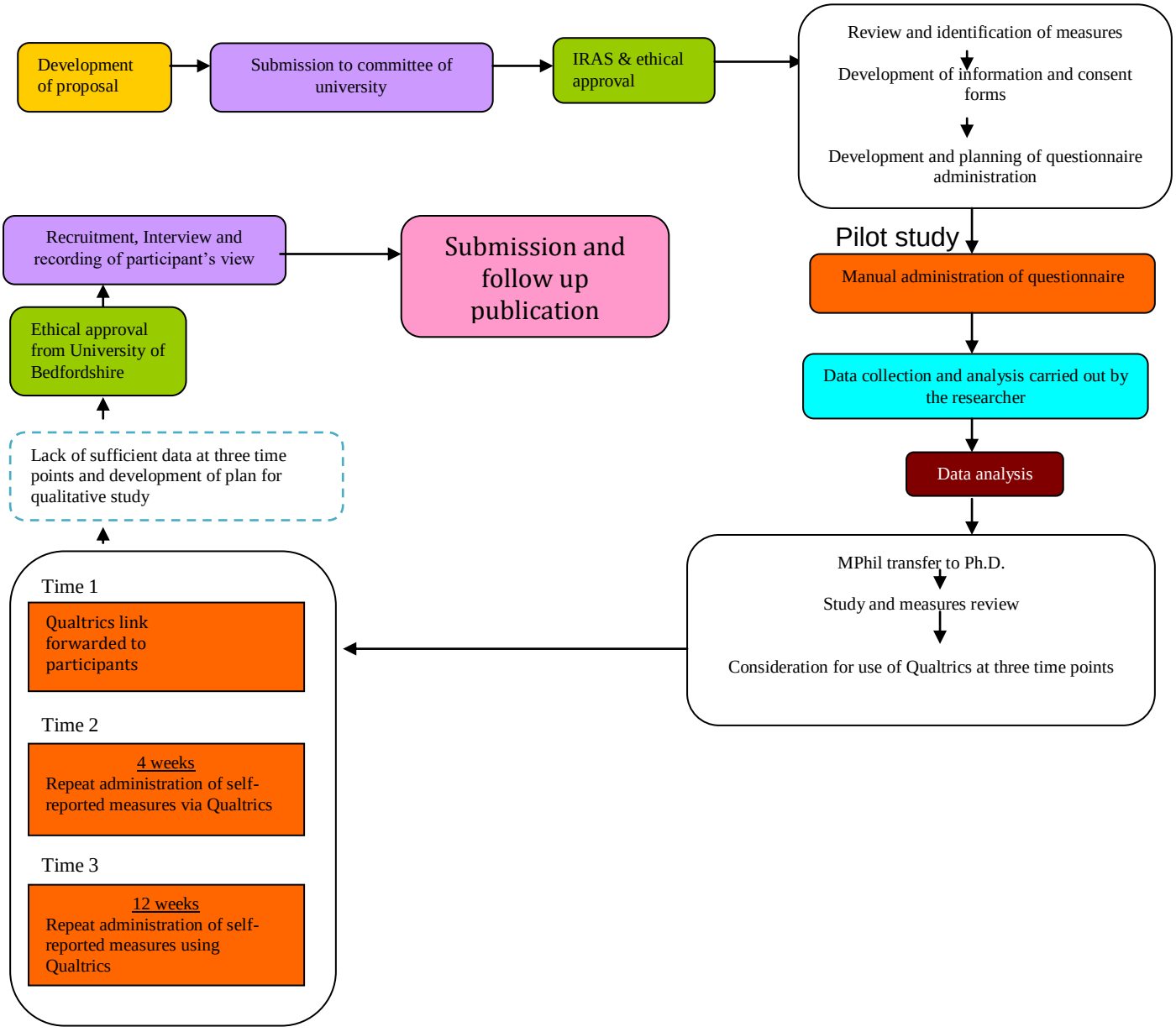


Figure 9 (4.1) Design of the main study

Procedural steps were taken similar to study 1, although additional changes included administration of measures, consenting and disclosure of information sheet about the study that was carried out electronically utilising Qualtrics software. Data was collected and downloaded into SPSS and AMOS system for analysis.

4.4 Data analysis and result

Computed data was analysed in three stages with initial stage considered a cross sectional analysis of data at the time one. Stage one of the analysis included correlation coefficient amongst the reported variables. The stage two considered multiple regression, scale reliabilities and model summary for PHQ9 and GAD7. The final stage reviewed and provided a path analysis by testing a hypothetical model and the variables correlations and their affiliations. The data analysis and process are described in more details next.

4.4.1 Stage 1: review of measures and their utility

In total eight self-reported measures were selected and administered via Qualtrics system in obtaining the data between the primary and secondary appraisals with the addition of neuroticism and GAD7 for anxiety and PHQ9 for depression. The gathered data produced 16 factorial variables shown in table 4.1. This study tested each significant variable and correlation with other corresponding item scores as well as total scores of each variable. Pearson two-tailed analysis was utilised to assess the correlation across these variables. As noted in the pilot study similar positive and negative correlations amongst variables were notable. For example, indication of positive correlation between mastery and meta-cognitive awareness may suggest the higher degree of mastery could predict person's insight into their state of subjective psychological wellbeing. Results also indicated notable negative correlations such as meta-cognitive awareness correlation with the DAS sub factor of success perfectionism. The negative correlation scores could potentially indicate that the lack of awareness would contribute to a high score of DAS Success Perfectionism and therefore a precursor to possible depressive presentation (PHQ9). The relationship between variables was significant across all factors as shown in the results of the correlation coefficient similar to the pilot study that could be seen on correlation matrix (table 4.1).

The scale constructs and their internally reliability as expected was comparable to previous studies with a significant Cronbach alpha values. Listwise analysis was utilised in test of value across a number of variables, Meta-Cognitive Awareness Questionnaire (MAQ) is a 9 item questionnaire with single factor offering a reliability at value of Chronbach's (α=*.729*). The reliability scores were comparable to Teasdale et al., (2001).

Similarly, the Dysfunctional Attitude Scale 24 item (DAS-24) with three sub factors indicated into eight questions each (DAS- Success/perfection reliability produced a Chronbach's (α= *.889*), DAS-need for approval value stood at Chronbach's (α= .801) and finally DAS self-control with Chrobach's (α=*.772*) suggesting an excellent construct and internal reliability. The scores of reliability also were comparable to previous studies (Moore et al., 2014; Power et al, 1994).

Table 17 (4.1) Correlations matrix from time 1; scale means ± SD, measures of internal consistency

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Mean	SD
1. Mastery	Pearson Correlation.	1																3.05	.43
	Sig. (2-tailed)																		
	N	270																	
2. Meta-cognition	Pearson Correlation	.320**	1															41.85	7.05
	Sig. (2-tailed)	.000																	
	N	245	252																
3. DAS Success Perfect	Pearson Correlation	-.449**	-.306**	1														27.20	10.13
	Sig. (2-tailed)	.000	.000																
	N	232	231	239															
4. DAS Need Approval	Pearson Correlation	-.361**	-.275**	.587**	1													3.48	1.00
	Sig. (2-tailed)	.000	.000	.000															
	N	233	232	235	240														
5. DAS self-control	Pearson Correlation	-.240**	-.324**	.501**	.343**	1												3.60	.95
	Sig. (2-tailed)	.000	.000	.000	.000														
	N	225	224	229	228	232													
6. Cop Problem focus	Pearson Correlation	.181**	.082	-.054	-.091	-.029	1											3.18	.64
	Sig. (2-tailed)	.006	.216	.413	.166	.664													
	N	227	227	230	231	223	235												
7 Coping Accommodation	Pearson Correlation	.065	.080	-.209**	-.124	-.098	.235**	1										3.07	.62
	Sig. (2-tailed)	.328	.233	.001	.060	.143	.000												
	N	226	226	229	230	223	232	234											
8. Coping Avoidance	Pearson Correlation	-.291**	-.261**	.183**	.196**	.223**	-.014	.152*	1									2.71	.83
	Sig. (2-tailed)	.000	.000	.005	.003	.001	.832	.020											
	N	226	226	229	230	223	232	232	234										
9. Coping Tension reduce	Pearson Correlation	.167*	.235**	-.185**	-.163*	-.220**	.176**	.323**	.089	1								3.32	.69
	Sig. (2-tailed)	.012	.000	.005	.013	.001	.007	.000	.175										
	N	227	227	230	231	223	233	233	233	235									
10. Coping Devaluation	Pearson Correlation	-.026	.024	-.084	-.093	-.024	.110	.376**	.408**	.252**	1							2.87	.74
	Sig. (2-tailed)	.697	.715	.208	.161	.717	.093	.000	.000	.000									
	N	226	226	229	230	222	233	232	232	233	234								
11. Neuroticism	Pearson Correlation	-.517**	-.266**	.528**	.467**	.250**	-.104	-.132	.230**	-.023	-.024	1						27.52	9.98
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.122	.050	.001	.730	.728								
	N	217	218	219	221	213	221	220	219	220	220	225							
12. Att. Internal/ex	Pearson Correlation	-.225**	-.251**	.348**	.311**	.371**	-.090	-.141*	.195**	-.105	-.136	.382**	1					18.09	4.88
	Sig. (2-tailed)	.002	.000	.000	.000	.000	.207	.046	.006	.139	.056	.000							
	N	195	197	199	199	193	199	200	200	200	199	197	202						
13 Att. Stability	Pearson Correlation	-.455**	-.124	.383**	.338**	.136	-.160*	-.077	.330**	-.079	-.029	.373**	.349**	1				17.53	4.30
	Sig. (2-tailed)	.000	.085	.000	.000	.060	.024	.281	.000	.270	.686	.000	.000						
	N	194	195	198	198	192	198	199	199	199	198	196	200	201					
14. Att. Globality	Pearson Correlation	-.366**	-.179*	.455**	.332**	.192**	-.153*	-.085	.265**	-.061	-.084	.490**	.530**	.550**				15.19	5.82
	N	193	194	197	197	191	197	198	198	198	197	195	199	199	200				
15. PHQ9	Pearson Correlation	-.535**	-.313**	.445**	.270**	.261**	-.110	-.077	.263**	.006	.065	.701**	.396**	.297**	.393**	1		14.33	5.56
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.100	.248	.000	.931	.335	.000	.000	.000	.000				
	N	222	222	224	225	218	226	224	224	225	225	220	198	197	196	230			
16. GAD7	Pearson Correlation	-.463**	-.273**	.415**	.326**	.272**	.003	-.136*	.173*	-.013	.027	.781**	.404**	.307**	.400**	.777**	1	11.77	4.79
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.966	.044	.010	.848	.684	.000	.000	.000	.000	.000			
	N	220	220	222	222	216	223	222	222	223	223	217	195	195	195	220	227		

** = P<0.05, ** = P<0.01, *** = P<0.001*

The correlation matrix represented in table 4.1offers a range of scores on both dependent and independent variables. The table 4.1 shows a number of significant indicators, highlighting the means, standard deviations and correlations of variables, as well as the variables reliabilities. Other measures such as CCS-15 devised by Guppy et al (2004) also produced excellent reliability across its sub-factors for example Coping Problem Focus- CPF showed a Chronbach's (*α=.708*) and Coping Accommodation-CA also indicated Chronbach's (α=.684). Similar scores noted on Coping Avoidance-CAv with Chronbach's (*α=.784*), and Coping Tension Reduction-CTR with the least reliability sub factor at Cronbach's (*α=.609*) and finally, Coping Devaluation-CD reliability of its value stood at Chronbach's (*α=.755*). The current investigation offered a good reliability for sub factors of coping, although Guppy et al., (2004) reported a better reliability for similar factors.

Interestingly, Neuroticism is a 12 item questionnaire with single factor showed the highest value with Cronbach's (*α=.923*) indicating an excellent reliability.

A modified version of Attentional Bias Questionnaire was utilised where 6 negative questions totaling to 24 responses (Hewitt and Flett., 2004) were adopted. Similar scores of reliability noted across all three sub factors of Attention Internal/External scores offered a reliability of Cronbach's (*α=.613*), similar scores noted for Attention Stability with the reliability of scores of Cronbach's (*α=.689*) and also Attention Globality with highest Cronbach's (*α=.771*) suggesting a good reliability across all attentional bias sub factors.

Finally, the two dependent variables of PHQ9 and GAD7 both with single item factor produced Cronbach's (*α=.901*) and Cronbach's (*α=.914*) respectively, that suggested an excellent reliability across both measures and the results were comparable to previous studies (Kroenke et al, 2001; Spitzer et al, 1999).

4.4.2 Stage 2: multiple regression and model summary for PHQ9 and GAD7

The phase two included multiple regression analysis of the same 16 factors and their inter item regressions that summed with a model summary. A number of significant variables noted in the results summary as it can be seen in table 4.2 (*r=.771, p<.000*) indicating a direct correlation with the outcome measures of depression (PHQ9).

Similar results were reported in table 4.2 that indicated a stronger correlation of predictability for symptoms of anxiety (GAD7) with a value of (*r=.816, p<.000*).

Table 18 (4.2) Multiple regression and model summary for PHQ9

	B	*Std. Error*	*β*	*t*	*p*
(Constant)	14.365	4.668		3.07	.002
Mastery	-2.693	.889	-.215	-3.02	.003
Meta-awareness	-.068	.043	-.096	-1.60	.111
DAS Success perfection	.006	.045	.011	.128	.898
DAS Approval need	-.642	.367	-.124	-1.75	.082
DAS self-control	.133	.375	.023	.355	.723
Coping Problem focus	-.310	.472	-.038	-.65	.513
Coping Accommodation	.067	.512	.008	.132	.895
Coping Avoidance	-.332	.430	-.051	-.77	.441
Coping tension reduction	.173	.461	.022	.377	.707
Coping devaluation	.620	.459	.087	1.35	.179
Neuroticism	.313	.040	.570	7.72	.000
Attention internal/external	.169	.073	.157	2.32	.021
Attention stability	.018	.085	.014	.209	.835
Attention globality	.018	.073	.019	.247	.805

Model summary: ***r = .771, r^2=.595, Adjusted r^2=.556 , F=3.61490 df=14, df=146, p=.000, p<.001***

Overall test of variables equation reported in the model summary in table 4.2 shows a significant correlation with depression with the value of (*β=14.36, t=3.07, p=.002*). The results signified the most reliable predictor with the strongest correlation to depressive symptoms was Neuroticism with significant value of (*p*<.000) followed by Mastery with a value of (*p*=.003). The model summary also offered the F-value (*F=3.61*, *df=14*, *Adjr^2=.556*) offered a 56% approximation of probability for prediction of PHQ9 therefore the symptoms of depression.

Similar finding were evident with the results of multiple regression analysis of anxiety symptoms (GAD7) presented in table 4.3. The model summary also produced a significant value of (*F*=20.86, *df=14*, *Adjr*^{2}=.633) suggesting an approximation of 63% probability of prediction of anxiety symptoms (GAD7).

Table 19 (4.3) Multiple regression and model summary for GAD7

	B	*Std. Error*	*β*	*T*	*P*
(Constant)	7.026	3.807		1.846	.067
Mastery	-1.729	.718	-.152	-2.410	.017
Meta-awareness	-.044	.034	-.069	-1.269	.207
DAS Success perfection	-.016	.036	-.034	-.444	.658
DAS Approval need	-.527	.297	-.114	-1.774	.078
DAS self-control	.142	.300	.028	.473	.637
Coping Problem focus	.602	.384	.081	1.569	.119
Coping Accommodation	-.561	.411	-.079	-1.366	.174
Coping Avoid	-.412	.348	-.070	-1.182	.239
Coping tension reduction	.329	.376	.047	.875	.383
Coping devaluation	.603	.372	.096	1.620	.107
Neuroticism	.363	.033	.748	11.114	.000
Attention internal/ext	.126	.059	.131	2.142	.034
Attention stability	-.001	.068	-.001	-.017	.987
Attention globality	-.024	.058	-.029	-.419	.676

Model summary: ***r = .816, r^2=.665 , Adj r^2 =.633 , F=20.862 df=14, df=147, p=.000, p<.001***

As it can be seen in table 4.3, analysis of data on anxiety and other variables produced a value of (*β=7.02 t=1.84, p=.067*) suggesting a positive correlation. Interestingly, the role of sub factors of attention bias were notable with significant values of predictability being evident, for example Attention stability correlated strongly with a value of (*p=.987*) and again Neuroticism was a significant indicator with a value of (*p=<.001*). Both could be considered as significant markers for prediction of anxiety symptoms (GAD7). Although, there were factors that could be singled out the active affiliation amongst all variables and the direction of correlations remained unknown, in order to address this concern a path analysis was conducted.

4.4.3 Stage 3: Path analysis for the pilot study

The primary utility of multiple regressions in this stage of the analysis related to the identification of the correlations between the independent and dependent variables. The correlations could be investigated by examination of effect on variables and their overall relational features.

Gathered data was assessed for their regression weight and their values that showed their predictive qualities and their affiliations with one another. The path analysis was drawn using AMOS in order to provide a theoretical relational explanation where the data set was uploaded for computation. The aim of the path analysis in this case was to examine the previously set out hypotheses whereby specific sets of cognitive measures could be utilised in the prediction of psychological wellbeing. It was postulated that the indicated hypotheses could be examined by estimation of equation and test of the hypothetical construct of the path's validity in prediction of psychological wellbeing.

In this section, similar approach to the pilot study was adopted that followed the model based on Fan, Thompson and Wang (1999) with suggestion that the Root Mean Square Error of Approximation (RMSEA) cut off point to be close to 0.06 and for the Comparative Fit Index (CFI) a cut-off value of 0.95 were considered. The assessment of confirmatory factor analysis of measures was conducted by analysing the structural equation and weight regression in two phases with both dependent variables of PHQ9 and GAD7.

4.4.3.1 Phase 1: CFA for all variables

In order to develop a suitable framework for analysis, further confirmatory analysis of measures was performed with all variables. This included an Oblique rotation analysis to obtain the single DAS factor as it can be seen in table 4.4. Further data analysis that was computed can be found in appendix 6.

Table.20 (4.4) Confirmatory factor analysis across all variables

	Chisq / df	TLI	CFI	RMSEA
DAS 1 factor	810.4 / 252	.626	.686	.101
DAS 3 factor	542.4 / 249	.801	.835	.074
ASQ 3 factor	145.4 / 51	.687	.795	.092
Mastery	43.8/ 13	.84	.93	.088
MAQ	175.4 / 27	.326	.595	.159
Neuroticism	4.10 / 2	.983	1.00	.058
Coping 5	171.9 / 81	.808	.870	.072
GAD-7	44.6 / 14	.911	.956	.100
PHQ-9	144.2 / 27	.744	.846	.141

In addition, the path diagrams drawn indicating the predictive associations and affiliations for the named variables can be found in appendix 7. As it can be seen in table 4.4, both single factor as well as total score of DAS was further tested in its three factor format that had been derived from Power et al (1994), interestingly indicating the better fit compared to the single factor alternative.

4.4.3.2 CFA for mediator and moderator path analysis

Having conducted the confirmatory analysis on the measures, three separate models were developed with different combinations including; a) model with DAS, Mastery and Neuroticism having a direct effect on psychological wellbeing, b) model with MAQ and ASQ as mediators, c) combination of mediator and direct effect and d) all having a direct effect (appendix.7).

An example of path diagram shown below in figure (4.2) indicates a direct effect of all varibles on prediction of psyhcological wellbeing, sympotms of depression and anxiety.

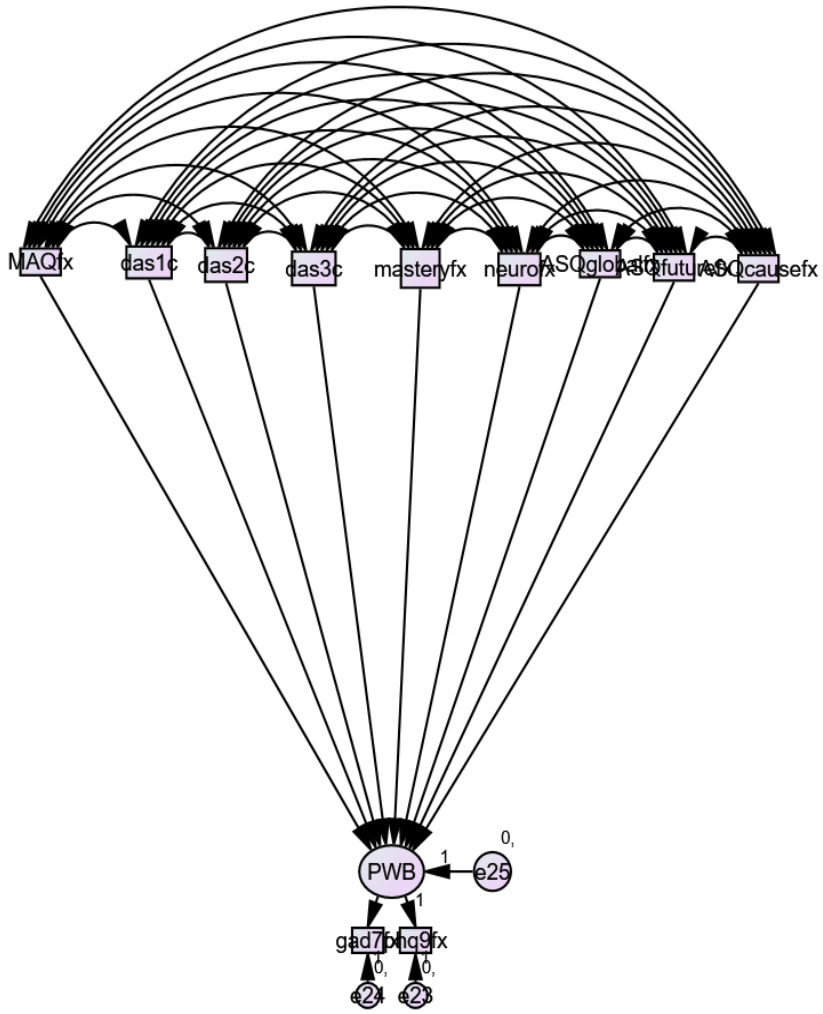


Figure 10 (4.2) all varaibles predicting wellbeing (Parachute model)

A single latent variable was considered as psyhcological wellbeing where it was sub divided into two symptomatic presnetations of anxiety (GAD7) and depression (PHQ9).

The factor scores in prediction for first three models produced an approximation of prediction that stood at 75% for the psychological wellbeing (PWB) and 87% and 73% for anxiety and depression respectively. Second model for prediction of estimation indicated 34% of psyhcological wellbeing could be estimated where as 64% and 90% were idneitifed for GAD7 and PHQ9. The third model with combination of both direct and indirect effect offered estimation of prediction indicating PWB=79%, GAD7=86% and PHQ9=73%, and the final model produced 79%, 86% and 73% respectivley for PWB, GAD7 and PHQ9. Although these scores of approximation appear significant the model fit did not match the desired and therefore did not fit with the model. Following these analysis further exmaination and exploration of model was performed that is described next.

4.4.3.3 Phase 2: path analysis and regression for PHQ9

The results highlighted in table 4.5 reports a number of affiliations amongst the variables that have shown to have a direct and indirect correlation that could be effecting on the predictability of the PHQ9. Examples of these variables are DAS-24 predicting Mastery with a value of (*β=-337, p<0.001*) and Attention predicting Mastery with a value of (*β=-.253, p<.001*). DAS-24 also correlated with MAQ with the value of (*β =-.278, p<.001*).

Other variables shown in table 4.5 are Mastery that correlated with Coping Avoidance (CAv) with the value of (*β=-.243, p<0.001*), Attention correlating with PHQ9 with the value of (*β=.245, p<.001*) and finally Mastery affiliating with depressive symptoms (PHQ9) with the value of (*β=-.346, P<.001*), that demonstrated the prediction of depression scores across a number of variables was viable and valid. However, interestingly and in contrast with previous studies the Coping problem-focus did not produce a significant correlation with MAQ. It also did not correlate closely with PHQ9. This could be explained by the fact that the coping strategies may be initiated by a secondary process of appraisals and the initiation of the coping would occur following the reappraisal of the experienced distress.

This analysis provided evidence that approximately about 42% of depressive symptom could be predicted using this path analysis. This probable prediction could suggest an important finding for predictability of depressive symptoms (PHQ9).

Table21 (4.5) Path analysis regression weight for predictability of PHQ9

			B	S.E.	C.R.	P	β
DAS	⇨	Mastery	-.013	.003	-4.95	***	-.337
ASQ	⇨	Mastery	-.009	.003	-3.54	***	-.253
DAS	⇨	MAQ	-.175	.047	-3.70	***	-.278
ASQ	⇨	MAQ	-.055	.045	-1.23	.219	-.096
Mastery	⇨	CPF	.257	.101	2.55	.011	.174
Mastery	⇨	CA	.072	.100	.724	.469	.050
Mastery	⇨	CAv	-.463	.124	-3.71	***	-.243
Mastery	⇨	CTR	.139	.107	1.29	.194	.088
Mastery	⇨	CD	-.060	.118	-.508	.612	-.035
MAQ	⇨	CPF	.003	.006	.412	.680	.028
MAQ	⇨	CA	.005	.006	.873	.383	.061
MAQ	⇨	CAv	-.022	.008	-2.80	.005	-.184
MAQ	⇨	CTR	.019	.007	2.89	.004	.196
MAQ	⇨	CD	.003	.007	.428	.669	.030
ASQ	⇨	PHQ9	.111	.030	3.72	***	.245
DAS	⇨	PHQ9	.074	.033	2.20	.028	.147
Mastery	⇨	PHQ9	-4.44	.821	-5.41	***	-.346
MAQ	⇨	PHQ9	-.102	.046	-2.20	.028	-.128
CPF	⇨	PHQ9	-.061	.469	-.130	.896	-.007
CA	⇨	PHQ9	-.509	.522	-.975	.330	-.057
CAv	⇨	PHQ9	-.187	.412	-.452	.651	-.028
CTR	⇨	PHQ9	1.06	.460	2.30	.021	.131
CD	⇨	PHQ9	.626	.459	1.36	.173	.083

** = P<0.05, ** = P<0.01, *** = P<0.001*

Predicting ⇨

4.4.3.4 Phase 3 (model fit summary for PHQ9)

Further analysis of data produced the model fit summary presented in table 4.6 that shows the results from conducting multiple correlations between the predictability of PHQ9. The noteworthy results reported here included Chi square, comparative fit index, degree of freedom and significant value of (CMIN χ^2 *=28.142*, *CFI=.958*, *df=10, p=.002*).

Results of confirmatory analysis included assessment of error of approximation with Root Mean Square Error of Approximation at (*RMSEA=.077*) and also Akaike Information Criterion (*AIC=138.142*) that suggested an overall excellent model fit with approximate prediction of 56% for PHQ9.

Table 22(4.6) Path analysis regression weight for predictability of PHQ9

Model	χ^2	df	p	CFI	RMSEA	AIC
	28.14	10	.002	.958	.077	138.14

Similarly, the model with computed data shown in figure 4.3 indicates the direction of correlation between variables. The independent variable correlation direction indicated along with *β* value that indicates the weight of regression as predictors of symptoms of depression. This would suggest that the prediction of symptoms is possible based on using identified sets of measures and the direction of their predictabilities. The model summary also produced an excellent fit, whilst correlation between DAS, Mastery, ASQ and Metacognitive Awareness were included to predict dispositional depression. Although the direction of correlation as demonstrated produced a good model fit, the direction of affiliation and correlations could be contested and it could be represented in bilateral terms within the model. It was assumed that a further assessment may highlight the affiliation and association more adequately and the direction of affiliation would be best tested when assessed longitudinally.

Hypothesised model of path analysis for PHQ9

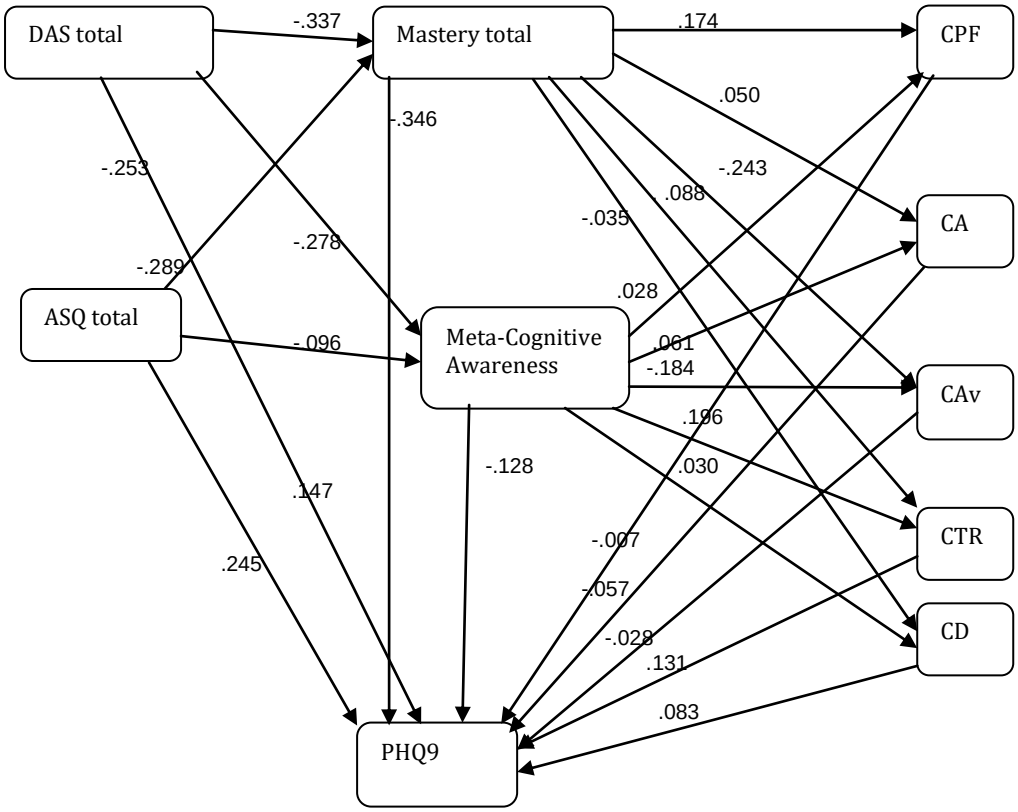


Figure 11 (4.3) Theoretical model of PHQ9 prediction with *β* value

4.4.3.5 Phase 4: path analysis and regression for GAD7

Similar investigation was conducted for anxiety (GAD7) and as it shown in table 4.7 the variables and the output values indicate the predictability of the anxiety symptoms (GAD7) with internal correlation amongst other independent variables. This equation demonstrated that DAS-24 negatively predicts mastery with a value of (*β=-.332, p<0.001*) that also suggested that the higher degree of mastery indicates a lower level of dysfunctional thinking style and higher scores of DAS-24. Other affiliations included Attentional bias scores that also were negatively predicting mastery (*β=-.252, p<0.001*) with similar interpretation.

Table 23 (4.7) Path analysis regression weight for predictability of GAD7

			B	S.E.	C.R.	P	*β*
DAS	⇨	Mastery	-.013	.003	-4.84	***	-.332
ASQ	⇨	Mastery	-.009	.003	-3.51	***	-.252
DAS	⇨	MAQ	-.175	.047	-3.68	***	-.278
ASQ	⇨	MAQ	-.050	.045	-1.12	.263	-.088
Mastery	⇨	CPF	.260	.101	2.57	.010	.176
Mastery	⇨	CA	.068	.100	.68	.496	.047
Mastery	⇨	CAv	-.445	.125	-3.54	***	-.233
Mastery	⇨	CTR	.140	.107	1.30	.191	.088
Mastery	⇨	CD	-.064	.119	-.536	.592	-.037
MAQ	⇨	CPF	.002	.006	.389	.697	.027
MAQ	⇨	CA	.006	.006	.903	.367	.063
MAQ	⇨	CAv	-.022	.008	-2.82	.005	-.186
MAQ	⇨	CTR	.019	.007	2.90	.004	.197
MAQ	⇨	CD	.003	.007	.451	.652	.032
ASQ	⇨	GAD7	.119	.027	4.45	***	.303
DAS	⇨	GAD7	.065	.030	2.17	.029	.151
Mastery	⇨	GAD7	-3.07	.738	-4.17	***	-.277
MAQ	⇨	GAD7	-.067	.042	-1.60	.109	-.097
CPF	⇨	GAD7	.831	.421	1.97	.049	.111
CA	⇨	GAD7	-1.07	.467	-2.30	.021	-.140
CAv	⇨	GAD7	-.581	.368	-1.57	.114	-.100
CTR	⇨	GAD7	.711	.413	1.72	.085	.102
CD	⇨	GAD7	.732	.411	1.77	.075	.112

** = P<0.05, ** = P<0.01, *** = P<0.001*
Predicting ⇨

Other negative prediction noted between DAS-24 and MAQ (*β=-.278, p<0.001*) as well as mastery and coping avoidance (*β=-.233, p<.001*).

In contrast, the positive correlation was evident between Attention and GAD7 (*β=.303, p<.001*) suggesting a higher degree of attention to the stimuli would suggest a higher degree of anxiety based difficulties. This finding is in tune with a meta-cognitive approach where the aim is to reduce the frequency and the degree of attention focused on the worry and rumination (Wells, 2008).

Finally, scores of mastery negatively predicted anxiety symptoms GAD7 with value of (*β=-.277, p<.001*) that also would indicate the lower degree of mastery would suggest the higher degree of experiences of anxiety based symptoms and sense of not being in control and therefore seeking retreat or considering coping avoidance. The results demonstrate that the prediction of anxiety scores across a number of variables could have positive or negative correlation that is based on their internal correlative matrix and their values. Other notable results included the relationship between coping problem focus (sub factor of coping) that did not produce a significant correlation with MAQ. Furthermore, Coping devaluation did not produce a significant score of prediction for GAD7 that fits with the idea of problem solving and devaluation of symptoms of anxiety will result in better management of an anxiety based problem. This also could suggest that the coping strategies could be initiated and maintained via a different mechanism.

4.4.3.6 Phase 5 (model fit summary for GAD7)

As it can be seen in table 4.8 results of the path analysis indicated strong correlations between the predictability of measures in relation to symptoms of anxiety (GAD7). The results from model summary analysis produced a significant value of (CMIN χ^2 *=28.25, CFI=.956*, *df=10, p*=.002). Similar to PHQ9 scores on assessment of Error of approximation produced a Root Mean Square Error of Approximation of (*RMSEA=.077*) with Akaike Information Criterion of (*AIC= 138.216*) that also suggested an excellent fit to the model. This model summary indicated an approximation prediction of 62% for GAD7 with an excellent model fit.

Table 24 (4.8) Path analysis regression weight for predictability of GAD7

Model	χ^2	*df*	*p*	*CFI*	*RMSEA*	*AIC*
	28.25	10	.002	.956	.077	138.21

The hypothesised model in figure 4.4 shows a direction of correlation of representing variables in their hypothesised position with *β* value as indicated for weight of regression for prediction of symptoms of anxiety. The correlation amongst the variables suggested that DAS, Mastery, ASQ and Metacognitive Awareness predict dispositional symptoms of anxiety. Furthermore, correlation for coping strategies adopted in response to distress caused by either internal or external factors shown to have a significant correlation. Similar to the PHQ9 model summary direction of correlation as demonstrated produced a good model fit, the direction of affiliation and correlations could be contested and it could be represented in bilateral terms within the model. The direction of affiliation would be tested more effectively when compared in two time periods.

Hypothesised model of path analysis for GAD7

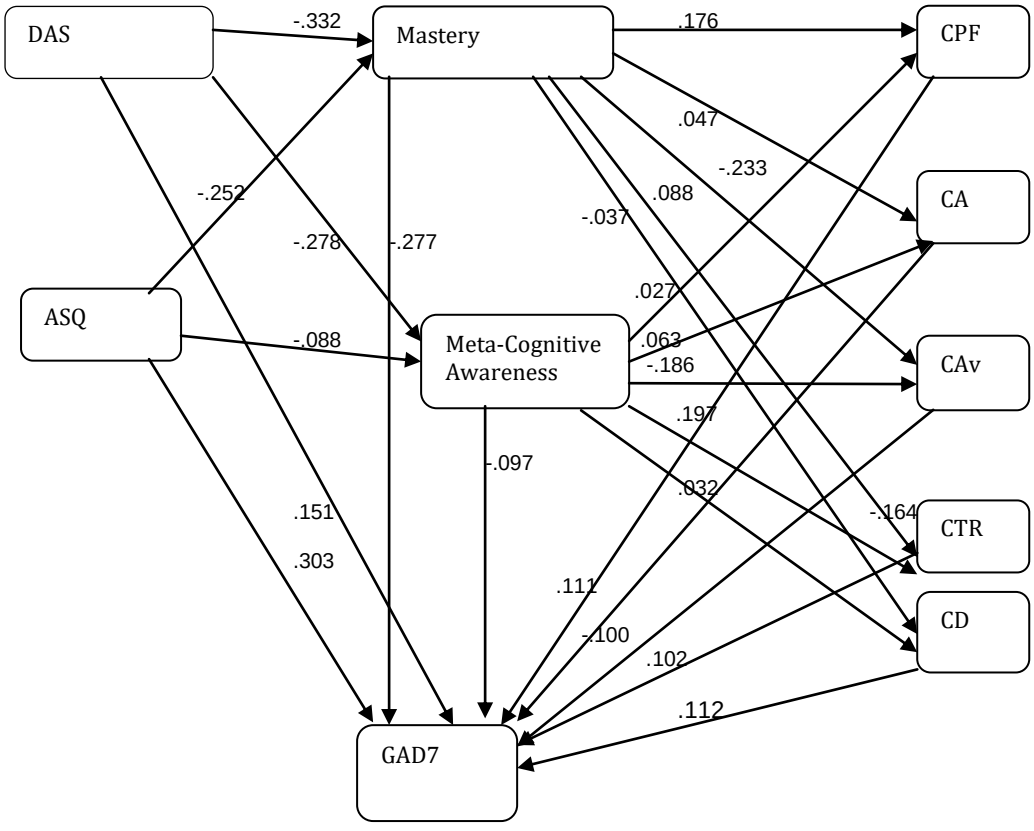


Figure 12 (4.4) Path coefficient for theoretical prediction of GAD7 with *β* value

4.5 Chapter summary: path analysis and examination of moderator and mediators for PHQ9 and GAD7

This chapter began by review of the previous findings from the pilot study, removing BDI-II and adding three measures of GAD7, PHQ9 and Neuroticism. Other additional changes to this phase of study the Qualtrics system was utilised in gathering the surveys and computing them for analysis. Participants were asked to complete the eight sets of measures (Mastery, meta-cognitive awareness, DAS-24, CCS-15, PHQ9, GAD7 and ASQ: 6 Negative items and Neuroticism) at this stage of the study and in addition, the initial hypotheses were reviewed and affirmed. This study included (n=310) participants of which 78% female and 22% male with age range of 35 with combination of diverse population.

This chapter investigated the correlation coefficient, multiple regression and path analysis amongst the selected 16 variables. Furthermore, the path analyses were performed similar to the pilot study. The first wave analysis included construct and reliability of PHQ9 and GAD7 with Cronbach's (*α=.901*) and GAD7 Cronbach's (*α=.914*), thereby suggesting an excellent reliability for both measures that are comparable to previous studies (Kroenke et al, 2001; Spitzer et al, 1999). This was followed with analysis of correlation coefficient in prediction of PHQ9 and GAD7 with significant scores across all variables was reported. Overall results of coefficient scores with a value of (*β=14.36, t=3.07, p=.002*) offered a significant correlation between the predictors and symptoms of depression. The results of multiple regression analysis for PHQ9 indicated the strongest correlation to depressive symptoms was reported by Neuroticism with significant value of (p<0.000) followed by Mastery with a value of (p=.003). The model summary also offered the F-value (*F=3.61*, *df=14*, $Adjr^2$*=.556*) offered a 56% approximation of probability for prediction of PHQ9 therefore the symptoms of depression. Stepwise regression analysis was performed in order to establish any possible subset of variables that contribute significantly or partially in prediction of variance, which in this case included correlation between ASQ and symptoms of depression (PHQ9). Further multiple regression analysis on GAD7 offered a model summary with a significant value of (*F*=20.86, *df=14*, $Adjr^2$=.633) suggesting an approximation of 63% probability of prediction of anxiety symptoms (GAD7).

Attention stability correlated strongly with a value of (*p=.987*) and Neuroticism was a significant indicator with a value of (*p=<.001*). Both could be considered as significant markers for prediction of anxiety symptoms (GAD7).

During the initial confirmatory analysis of all variables DAS-24 single item performed poorly compared to the three factor items, this finding was similar to Power et al, (1994). The summary of models and confirmatory analysis were reviewed (appendix.6 and 7). Further analysis was conducted to test the integrity of the model with the single latent variable for prediction of psychological wellbeing (PWB). Interestingly, high predictions percentage scores amongst all developed models were evident; however the structural equation and model summary did not offer a good fit and therefore an amendment was considered.

An additional path analysis was conducted with the hypothesised model that produced a number of positive and negative correlations with PHQ9 in table 4.5 and fig 4.3. Similar data scores were observed with GAD7 in table 4.7 and fig 4.4. Mastery, DAS-24 and ASQ appeared to have greater correlation with both PHQ9 and GAD7 compared to other variables.

The test of reliability and coefficient correlation was conducted, producing a model summary with a value of (χ^2*=28.14, df=10, p=.002, CFI=.958, RMEA=.077, AIC=138.14*) suggesting an excellent model fit for prediction of depressive symptoms (PHQ9). Similarly, the results of path analysis correlation for GAD7 indicated in the model summary produced a value of (*χ^2=28.25, df=10, p=.002, CFI=.956, RMEA=.077, AIC=138.21*), suggesting an excellent model fit for symptoms of anxiety (GAD7). The correlation coefficient and hypothesised model offered in this study produced some interesting results, which were comparative to the results from the pilot study.

These models produced an approximation of predictability for GAD7 and PHQ9 were 63% and 56% respectively with excellent model fit for both. Other observed findings included the covariance and paradoxical relationship between the variables.

For example, the predictability of PHQ9 or BDI-II was closely matched and they were highly correlated with independent variable. Similarly, mastery, DAS-24 and ASQ, as well as negative correlation with MAQ offered interesting findings that showed affiliation and correlation with depressive symptomatic presentation.

Otherwise, the negative correlations amongst the variables could be explained in terms of a positive or negative state of subjective psychological wellbeing at a given time. The lack or reduction in one variable could have a paradoxical effect on other variables; for example, a lack of awareness could indicate an active dysfunctional thinking style and, therefore, a potential for the presence of symptoms of anxiety or depression. In turn, the scores could be considered as positively or negatively correlated, such that they are dependent on absence or presence of psychological distress.

Finally, the direction of correlation produced a good model fit, although the direction of affiliation and correlations could be contested and it could be represented in bilateral terms within the model. The direction of affiliation would be best tested when compared longitudinally at two-time period.

In the light of the current analysis and some degree of limitation due to sample size, it was natural to repeat the test and examine the validity of the hypotheses and reported models. Therefore, a further assessment of these variables at different time point was preformed and presented in the next chapter. This will be followed by further examination of data where the affiliation and direction of the variables would be explored in chapter six.

Chapter Five: Method and results of the second and third wave

5.1 Overview of results from second and third wave

Thus far this investigation has produced a number of analyses in establishing a working model that could provide explanation for predictive quality of measures utilised. The main phase of this study is divided into three sections that include initial review and investigation similar to the pilot study where initial hypotheses were tested with (n=310) participants. The second phase of this study has considered review of regression and correlation of reported data at two time periods. Unfortunately, a significant drop out of participants was notable. A total of (n=57) participants produced full data sets and therefore some adjustments in data analysis were considered in addressing the short falls.

Initial section of this chapter aims to examine the reliability and validity of the selected measures as well as confirmation of the role of the same measures as predictors of psychological wellbeing. In order to draw a comparison with previous chapters of this study, this chapter will be investigating the hypotheses set out previously by repeating the same test of regression, performing t-test with paired samples and test of inter correlations between each items. The latter part of this test would include conducting a comparative path analysis where the weight of correlations could be measured and assessed across time one and time two, highlighting the significance of the findings.

5.2. Method

It is noteworthy to report that use of Qualtrics allowed the employment of the same measures that had been utilised previously. All participants were invited via a mailing system through Qulatrics. It is noteworthy to report that use of Qualtrics allowed the employment of the same measures that had been utilised previously.

5.2.1. Participants

The participants from the first study were invited to complete the survey of the same sets of questionnaire. A greater dropout rate was notable with a total of (n=61) participants managed to complete the full data set. Distribution of female (n=50) to male (n=11) was 82.5% and 17.5% respectively with mean range of 37years of age. The ethnic compositions of the participants were simplified to previous parameters of Caucasian (n=50); Black (n=0) and Other Minorities (n=11) who had completed the responses.

5.2.2. Procedure

The second and third wave analysis presented in this chapter includes multiple regression analysis, t-test of paired samples statistics and correlations. The main objective of the data analysis in this phase was to review the correlation between the variables in time one and time two. The data analysis reported in this chapter offered support in the predictability of cognitive measures utilised in the prediction of depressive (PHQ) and anxiety symptoms (GAD7).

Previously indicated hypotheses were tested as predictor of psychological wellbeing where a number of significant correlations were reported. Therefore, it is possible to assume that any potential changes in cognitive processes between time one and time two scores would indicate a change in psychological wellbeing.

In order to assess this hypothesis an assessment of multi-variant within-subjects the t-test would be conducted. The analysis of scores was conducted to identify any differences in variables of DAS-24, ASQ, Mastery, MAQ, CCS-15, Neuroticism, GAD7 and PHQ9 indicating their correlation coefficient scores between time one and time two with the same variables.

5.3. Result and data analysis

5.3.1. Regression analysis at time two

The regression analysis was conducted in order to examine the relationship between the variables. The main aim of this analysis was to explore and affirm the interactions between the variables, their total and sub-factor scores when compared with depression and anxiety. In order to achieve the desired outcome the Pearson product-moment was utilised for analysis of correlation coefficient and paired sample T-test across all variables, although some data was not complete and deemed inadequate.

A degree of fragmentation of results in this section was noted along with limitation in sample size. Therefore, in addressing such short fall, a stepwise regression analysis was performed in eliminating the non-significant correlations of variables. As it can be seen in table 5.1, the regression analysis of measures of time two for *66* participants was computed, although an accurate data analysed ranged between 50 and 57 accurate responses. The results produced an excellent value of (*p<.000)* across a number of variables.

Table 25 (5.1) Reliability of variables at time two (n=66)

Scale mean	*St. Mean*	*St.dv*	*Cronbach α*
Mastery	21.33	3.10	.82
Meta-Cognition	37.80	33.89	.91
DAS-success/perfectionism	27.42	9.45	.91
DAS-approval/need	27.08	8.00	.83
DAS-control/achievement	28.71	6.36	.69
Coping-Problem focus	9.38	1.72	.62
Coping- accommodation	9.33	1.67	.67
Coping-avoidance	8.19	2.60	.82
Coping-tension reduction	9.92	1.86	.45
Coping-devaluation	8.26	2.41	.81
Depression-PHQ9	14.10	5.58	.90
Anxiety-GAD7	11.43	4.34	.89
Neuroticism	26.59	10.44	.94
Attribution-internality	17.35	4.48	.57
Attribution-stability	17.17	3.54	.49
Attribution-Globality	14.14	5.51	.71

Additionally, interesting unexpected findings were noted, such as an overall low scores of Cronbach α for Coping, more specifically the sub factor of coping tension reduction with Cronbach (*α=.45*). Whereas, in contrast there were high scores also noted that included the Cronbach (*α=.94*) for Neuroticism, MAQ with Cronbach (*α=.91*) and DAS success perfectionism with Cronbach (*α=.91*). These findings were consistent with results in the pilot and first phase of the main study in chapter four.

5.3.2. Regression analysis for PHQ9

Similarly, a Stepwise regression analysis was performed at the time two for prediction of depressive symptoms as shown in table 5.2 where PHQ9 set at Zero order correlation with value of (*r=.864*). The regression analysis indicated here with a significant value of (*β=1.92, t=10.41, p<.000*) that suggested a correlation coefficient scores for both unstandardised and standardised scores in prediction of PHQ9.

Interestingly, a closer correlation with the sub factor of ASQ was notable, as shown in table 5.2. Attention Globality scores at the time two with the value of (*β=.19, t=1.99, p=.053)* with Zero order score of (*r=.518*).

Table 26 (5.2) Regression analysis and zero order score for PHQ9

		B	Std. Error	*β*	*t*	*p*	*r*
1	(Constant)	1.92	1.37		1.393	.172	
	PHQ9	.889	.085	.864	10.41	.000***	.864
2	(Constant)	-.110	1.67		-.066	.948	
	PHQ9	.810	.091	.787	8.89	.000***	.864
	Attention Globality	.194	.097	.177	1.99	.053	.518

** = P<0.05, ** = P<0.01, *** = P<0.001*

5.3.3. Regression analysis for GAD7

A similar method of stepwise regression analysis was conducted for anxiety symptoms GAD7 at Zero order correlation value of (*r=.911*). As it can be seen in table 5.3, the coefficient correlation similarly produced a significant value of (*β=1.97, t=13.21, p<.000*) indicating a strong correlation coefficient scores for both unstandardised and standardised scores for anxiety (GAD7).

Otherwise, a closer correlation with the sub factor of ASQ was evident as Attention Globality scores in time two was shown in table 5.3 produced a value of (*β=.14, t=2.25, p=.030)* with Zero order reported at (*r=.594*).

Table 27 (5.3) Coefficient and zero score for GAD7

		B	Std. Error	*β*	*t*	*P*	*R*
1	(Constant)	1.974	.826		2.390	.022	
	GAD7	.841	.064	.911	13.217	.000***	.911
2	(Constant)	.513	1.016		.505	.617	
	GAD7	.759	.070	.823	10.815	.000***	.911
	Attention Globality	.146	.065	.172	2.256	.030	.594

** = P<0.05, ** = P<0.01, *** = P<0.001*

5.3.4. Paired sample statistics for time one and time two

In order to examine the data and their projection in other variables in time one and time two, a paired sample t-test was conducted, as shown in table 5.4 a comparison between the independent and dependent variables at both time and time two were observed. Paired sample statistics indicated a strong correlation between variables from time one in prediction of time two variables. These analyses considered a 16 paired sample analysis shown in table 5.4 where data from time one and time two were evaluated.

Comparative data analysis and the results suggested minimal differences in value across the two examined variables for PHQ9 at time one values of (M=14.10, SD=5.54) and PHQ9 at time two (M=14.35, SD=5.61) with the condition remaining at the value of (t=-.63, df=55, p=.52). Similar scores for GAD7 in time one (M=11.44, SD=4.83) were noted and it seemed comparable with the time two (M=11.61, SD=4.52) at the condition with value of (t=-.49, df=51, p=.625) highlighting a close statistical values between the two variables. Other results from the independent variables represented in table 5.4 with Mastery produced similar close values at the time one (M=3.01, SD=.43) compared to time two (M=3.00, SD=.45) at the condition value of (t=.38, df=52, p=.77).

Other variable scores also showed to have statistical significance such as MAQ at time one (M=42.58, SD=6.39) and time two (M=42.39, SD=6.30) indicated the statistical value of (t=.26, df= 52, p=.79). Interesting finding included the scores of MAQ that showed a close correlation with dependent variables of PHQ9 and GAD7. This close association could suggest a potential for their internal correlation at both time and time two. The link between these variables could be simplified in two phases where the scores from primary independent variable correlate with time two independent variables. The second phase would be the potential correlation for both times one and time two scores and their correlation with rumination and relapse (MAQ scores) as described by Teasdale et al (2001). Similarly, DAS Success Perfectionism at both times produced a statistically significant value of (t=.10, df= 55, p=.91) suggesting a strong internal correlation with PHQ9.

The DAS sub factor of Self Control indicated a value of (t=-.27, df=52, p=.788) in the paired sample test with statistical significance. However, the DAS sub factor of Need for Approval paired test values of (t=2.09, df=55, p=.41) did not produce the expected score. The DAS sub factor scores in prediction of PHQ9 produced and overall statistically significant values and showed a good internal correlation at both times one and two. Unsurprisingly, the results produced here, were similar to previous studies (Teasdale et al., 2001) with significant correlations between PHQ9 scores at time one and time two.

Other variables showed to have correlation and as it can be seen in table 5.4 all of the coping sub factor scores produced a positive correlation, namely Coping Problem Focus-CPF with values of (t=.49, df=55, p=.62) produced the highest significant value of all variables, potentially suggesting the importance of suitable coping strategy that is associated with psychological wellbeing.

Other paired samples included Coping Accommodation-CA with values of (t=-.58, df=55, p=.56), Coping Avoidance-CAv values of (t=-.60, df=54, p=.54) that could indicate the first instant of avoidance could predict potential future coping avoidance strategies.

Coping Tension Reduction-CTR scores of paired sample offered values of (t=-.56, df= 56, p=.57) and Coping Devaluation-DV value of (t=-.12, df=55, p=.90) that provided a significant scores and suggestion of its strong internal correlation with PHQ9. Although, the results of Neuroticism produced the most significant value in the paired sample analysis with value of (t=1.05, df= 51, p=.29). The initial observation may suggest that the score of value p did not seem significant.

However, where the p value scores taken into account with the t value the scores would suggests a statistically significant value. Similarly, Attention internal and external paired sample at both times showed paired values of (t=2.01, df=50, p=.04), and attention stability indicated values of (t=1.66, df=51, p=.10) that regarded as significant. Unexpectedly, the ASQ sub factor scores for Attention Globality paired values of (t=3.13, df= 49, p<.000) indicated an excellent overall scores across all attribution sub factors.

Paired sample statistics in both time one and time two shown in table 5.4 produced positive scores that ranged from good to excellent values across all variables.

Table 28 (5.4) Paired sample statistics for time one and time two

		Mean	*N*	*Std. Deviation*	*Std. Error Mean*
Pair 1	Mastery	3.01	53	.43	.06
	Mastery t2	3.00	53	.45	.06
Pair 2	MAQ	42.58	53	6.39	.87
	MAQ t2	42.39	53	6.30	.86
Pair 3	DAS/Success perfection	28.25	56	10.54	1.40
	DAS/Success perfection t2	28.16	56	9.27	1.23
Pair 4	DAS/approval need	3.64	56	1.05	.14
	DAS/approval need t2	3.44	56	.98	.13
Pair 5	DAS/self-control	3.55	53	.87	.12
	DAS/self-control t2	3.58	53	.74	.10
Pair 6	CPF	3.14	56	.57	.07
	CPF t2	3.11	56	.58	.07
Pair 7	CA	3.07	56	.60	.08
	CA t2	3.12	56	.57	.07
Pair 8	CAv	2.67	55	.75	.10
	CAv t2	2.75	55	.87	.11
Pair 9	CTR	3.22	57	.59	.07
	CTR t2	3.27	57	.62	.08
Pair 10	CD	2.76	56	.62	.08
	CD t2	2.75	56	.80	.10
Pair 11	PHQ9	14.10	56	5.54	.74
	PHQ9 t2	14.35	56	5.61	.75
Pair 12	GAD7	11.44	52	4.83	.67
	GAD7 t2	11.61	52	4.52	.62
Pair 13	Neuroticism	27.75	52	10.89	1.51
	Neuroticism t2	27.00	52	10.25	1.42
Pair 14	Attention int/ext	18.41	51	4.80	.67
	Attention int/ext t2	17.37	51	4.64	.65
Pair 15	Attention stability	18.17	52	4.06	.56
	Attention stability t2	17.38	52	3.33	.46
Pair 16	Attention globality	16.50	50	5.54	.78
	Attention globality t2	14.70	50	5.13	.72

5.3.5. Paired sample correlation

The result from the previous data analysis was taken further for paired sample correlation amongst the identified variables and as it can be seen in table 5.5 paired sample correlation between time one and time two of measures were computed and tested. As predicted PHQ9 (r=.862, p<.000) and GAD7 (r=.853, p<.000) showed to have a significant correlations. Although the highest correlation was noted for Neuroticism at the value of (r=.884, p<.000), and the lowest reported score was noted for coping avoidance (r=.418, p<.001). This contrast could be interpreted in biological terms, when primary responses are based at inherent level that is linked to the individual's characteristics. And therefore are considered as pre-marker of wellbeing, whereas coping strategy of avoidance are deployed following the experiences of stimuli and seeking to have the positive effect in managing ones wellbeing.

Table 29 (5.5) Correlation paired sample for time one and time two

Pair		*N*	*r*	*p*	*t*	*Df*	*p(2.tailed)*
1	Mastery and mastery	53	.816	.000***	.289	52	.774
2	MAQ and MAQt2	53	.673	.000***	.267	52	.790
3	DAS Success perfection and DAS Succ/perf t2	56	.806	.000***	.106	55	.916
4	DAS approval need and DAS approval need t2	56	.755	.000***	2.095	55	.041
5	DAS self-control and DAS self-control t2	53	.644	.000***	-.271	52	.788
6	CPF and CPF t2	56	.563	.000***	.493	55	.624
7	CA and CA t2	56	.468	.000***	-.586	55	.560
8	CAv and CAv t2	55	.418	.001***	-.609	54	.545
9	CTR and CTR t2	57	.467	.000***	-.562	56	.576
10	CD and CD t2	56	.533	.000***	.125	55	.901
11	PHQ9 and PHQ9b	56	.862	.000***	-.638	55	.526
12	GAD7 and GAD7b	52	.854	.000***	-.491	51	.625
13	Neuroticism and Neuroticism t2	52	.884	.000***	1.054	51	.297
14	Attention int/ext and Attention int/ext t2	51	.697	.000***	2.016	50	.049
15	Attention stability and Attention stability t2	52	.591	.000***	1.668	51	.101
16	Att. Globality and Att. Globality t2	50	.714	.000***	3.138	49	.003

** = P<0.05, ** = P<0.01, *** = P<0.001*

The matrix of correlation at time two reported in table 5.6 indicating that there are positive associations amongst a number of variables that was comparable to the previous matrix correlation in support of the previously held hypotheses. This included the notion that psychological wellbeing as in this case depression and anxiety could be predicted by specific sets of cognitive measures as shown in the table 5.6.

Table 30 (5.6) Correlations matrix from time two; scale means ± SD, measures of internal consistency

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Mean	SD
1Mastery	Pearson Correlation	1																21.33	3.10
	Sig. (2-tailed)																		
	N	66																	
2 Meta-Cognition Aw	Pearson Correlation	.294*	1															37.80	33.89
	Sig. (2-tailed)	.017																	
	N	66	66																
3 DAS Success Perf	Pearson Correlation	-.574**	-.227	1														27.42	9.45
	Sig. (2-tailed)	.000	.069																
	N	65	65	65															
4 DAS App	Pearson Correlation	-.456**	-.195	.638**	1													27.08	8.00
	Sig. (2-tailed)	.000	.120	.000															
	N	65	65	64	65														
5 DAS Self control	Pearson Correlation	-.198	-.370**	.206	.108	1												28.71	6.36
	Sig. (2-tailed)	.120	.003	.105	.399														
	N	63	63	63	63	63													
6 Cop Problem focus	Pearson Correlation	.472**	.209	-.148	-.268*	-.266*	1											9.38	1.72
	Sig. (2-tailed)	.000	.095	.242	.033	.037													
	N	65	65	64	64	62	65												
7 Cop Accommod	Pearson Correlation	.400**	.234	-.104	-.118	-.108	.295*	1										9.33	1.67
	Sig. (2-tailed)	.001	.058	.408	.350	.402	.017												
	N	66	66	65	65	63	65	66											
8 Cop Avoid	Pearson Correlation	-.127	.172	.214	.057	-.057	-.219	.287*	1									8.19	2.60
	Sig. (2-tailed)	.326	.181	.097	.661	.668	.091	.024											
	N	62	62	61	61	59	61	62	62										
9 Cop Tension Redu	Pearson Correlation	.371**	.379**	-.180	-.256*	-.292*	.261*	.466**	.255*	1								9.92	1.86
	Sig. (2-tailed)	.002	.002	.152	.039	.020	.036	.000	.046										
	N	66	66	65	65	63	65	66	62	66									
10 Cop Devaluation	Pearson Correlation	.013	.050	.037	-.021	.133	-.198	.340**	.703**	.200	1							8.26	2.41
	Sig. (2-tailed)	.916	.688	.770	.869	.297	.114	.005	.000	.107									
	N	66	66	65	65	63	65	66	62	66	66								
11 Neuroticism	Pearson Correlation	-.572**	-.044	.626**	.521**	-.003	-.146	-.153	.044	-.321**	-.171	1						26.59	10.44
	Sig. (2-tailed)	.000	.733	.000	.000	.980	.253	.226	.734	.010	.176								
	N	64	64	63	63	61	63	64	61	64	64	64							
12 Att. Internal/ex	Pearson Correlation	-.209	-.195	.383**	.230	.223	-.264*	-.079	.080	-.061	.020	.144	1					17.35	4.48
	Sig. (2-tailed)	.105	.132	.003	.077	.092	.042	.545	.544	.640	.876	.272							
	N	61	61	60	60	58	60	61	60	61	61	60	61						
13Att. Stability	Pearson Correlation	-.245	-.121	.541**	.352**	.255	-.207	-.133	.184	-.252*	.080	.321*	.352**	1				17.17	3.54
	Sig. (2-tailed)	.054	.350	.000	.005	.051	.110	.302	.156	.048	.537	.012	.005						
	N	62	62	61	61	59	61	62	61	62	62	61	61	62					
14Att. Globality	Pearson Correlation	-.392**	-.219	.577**	.400**	.082	-.298*	-.140	.048	-.308*	-.079	.596**	.441**	.510**	1			14.14	5.51
	Sig. (2-tailed)	.002	.089	.000	.002	.541	.021	.282	.715	.016	.545	.000	.000	.000					
	N	61	61	60	60	58	60	61	60	61	61	60	60	61	61				
15 PHQ9	Pearson Correlation	-.635**	-.160	.607**	.388**	.128	-.246	-.223	.149	-.245	-.046	.708**	.289*	.360**	.592**	1		14.10	5.58
	Sig. (2-tailed)	.000	.215	.000	.002	.335	.056	.082	.256	.055	.722	.000	.026	.005	.000				
	N	62	62	61	61	59	61	62	60	62	62	60	59	60	59	62			
16 GAD7	Pearson Correlation	-.598**	-.304*	.656**	.439**	.201	-.215	-.218	.153	-.252*	-.048	.751**	.287*	.403**	.605**	.852**	1	11.43	4.34
	Sig. (2-tailed)	.000	.015	.000	.000	.121	.091	.084	.235	.044	.705	.000	.025	.001	.000	.000			
	N	64	64	63	63	61	63	64	62	64	64	62	61	62	61	62	64		

** = P<0.05, ** = P<0.01, *** = P<0.001*

5.4. Chapter summary: Method and results of the second and third wave

The purpose of this chapter was to investigate the correlation and regression amongst the variables at time one and time two. In order to achieve the desired effect, the Pearson product-moment was utilised for analysis of correlation coefficient and paired sample T-test across all variables with 66 participants. The data was not complete in some section and therefore the data from 5 participants were omitted. Distribution of female (n=50) to male (n=11) was 82.5% and 17.5% respectively with mean range of 37 years of age. The ethnic compositions of the participants were simplified to previous parameters of Caucasian (n=50); Black (n=0) and Other Minorities (n=11) who had completed the responses.

The aim also included the analysis of the interactions between the variables, their total and sub-factor scores when compared with depression and anxiety. Previous studies (Guppy and Weatherston, 1998; Moore et al., 2014; Teasdale et al., 2001) have investigated the correlation between variables using similar methodology, although none has considered a similar combination of measures in their investigations. The results produced significant values on the multifactorial dimensions, indicating direct and indirect interactions between the variables. Dispositional indicators of dysfunctional attitude in relation to emotional measurements of PHQ9 and GAD7 produced an excellent Cronbach *α* value. Regression analysis for PHQ9 at time 2 produced a statistically significant value of (*r=.864, p<.000*), which was also mirrored with a significant value of (*r=.853, p<.000*) for GAD7. The highest correlation coefficient was again reported by neuroticism (*r=.884, p<.000*), indicating a significant value similar to previous studies (Hewitt et al., 2004).

In the paired sample T-test, ASQ produced significant scores with the highest sub-factor was Globality-paired values of (*t=3.13, df=49, p<.000*). Surprisingly, low scores were also noted for coping in regression analysis. However, the correlation and paired sample T-test for coping was also significant with the lowest value reported for coping avoidance with a value of (*r=.418, p<.001*).

The results of regression analysis in this study did not produce similar findings to the previous studies on coping (Guppy and Weatherstone, 1997; Guppy et al., 2004), although the overall correlation coefficient at time one and time two was significant.

As can be seen in table 5.5, correlations for independent and dependent variables were significant at both time one and time two. This result could suggest an internal variability for utility of sub-factors in prediction of scores at time two. This could offer a different proposition in recognition of wellbeing by investigating the inter-item variability and their correlation with psychological wellbeing.

Interestingly, all the variables were significantly correlated, as can be seen in table 5.6 where the matrix of correlation has been presented. Consistently, the neuroticism score showed the highest correlation with depression and anxiety symptoms. The possibility of internal emotional responses could be described by personality traits, in which the primary role of neuroticism comes to the fore (Lesch et al., 1996).

It is notable to review that the fragmented aspects of the results could have been due to content domain and therefore, the assessment of different content domains could explain some negatively correlated results. As such, a further test of integrity of the variables and their utility was needed. This could be achieved by conducting a longitudinal analysis of variance. The next chapter considered a longitudinal analysis in line with previously established methodological approaches that are described next.

Chapter Six: Longitudinal Analyses

6.1 Overview of longitudinal analyses

This chapter aims to expand on the examination of the previously held hypotheses whilst performing similar methodological approach. Although previous chapter and the reported analyses provided reasonable outcomes, noticeable limitation in number of the gathered data and their subsequent impact on the results could not be ignored. Therefore in addressing such concern longitudinal analyses was adopted for time one and time two.

A systematic review of past and recent publications identified a number of studies that have adopted similar strategies whereby the correlation between DAS and depression has been examined, utilising a longitudinal methodological approach (Beck, 1976; Clark and Beck, 1999; Burt et al, 1995; Davey et al, 1992; Segal et al, 2002, 2013). This chapter adopted a similar longitudinal methodological approach to previous studies (Teasdale et al., 2001; Beevers, Ryan and Miller 2003; Fresco et al, 2007) by examining the data at two time periods, whilst the objective remains where utility of measures are maintained as predictors of psychological wellbeing.

It is postulated that the data will provide a more adequate method of confirming the hypotheses. This would be examined by testing the changes in scores of independent variables across two time periods. The regression analysis of variance will be utilised in comparing the dependent variables of PHQ9 and GAD7. In order to achieve the desired outcome a series of analysis had been carried out that included regression analysis and path analysis, similar to the previous three chapters.

Following a series of factor confirmatory analysis and path analyses, a number of models produced that are represented in appendix 6 and 7. The integrity of the theoretical model was tested using the data from time two. A final theoretical explanation has been offered leading to two path analysis models for PHQ9 and GAD7 respectively. These analyses are reflected on the primary conceptualised theoretical framework on page 34.

Significant correlations and regressions scores were reported in the final analysis, offering an excellent model fit by indicating prediction of depressive symptoms (PHQ9) with an approximation probability of 62% and similar scores of prediction for anxiety symptoms with an approximation probability of 65% for GAD7.

Furthermore, as expected the scores from time one produced significant values in prediction of time two scores. Interestingly, when coping was removed from the equation results indicated a higher prediction percentage with an approximation of a probability of 70% for time one and an approximation of 74% at time two for PHQ9. Similar results were evident for GAD7 at an approximation probability of 76% at time one and an approximation of 71% at time two. The results for time one and time two offered key findings in prediction of symptoms of depression and anxiety.

6.2 Method

In order to examine the integrity of the proposed hypotheses, data from the second study at time one and time two was compared.

6.2.1. Participants

The participants (n=57) provided the full sets of data that could be computed and tested. Participants comprised of (n=48) with 82.5% female and (n=09) and 17.5% male respectively with average age range of 37. The ethnic compositions of the participants were simplified to previous parameters of Caucasian (n=50); Black minority (n=0) and Other Minorities (n=11).

6.2.2. Procedure

The regression analysis of variables was conducted, testing dispositional indicators in association with the independent variables of PHQ9 and GAD7. The predictability of the reported measures were correlated during the analysis of data that produced results with the statistically significant value of ($p<0.00$).

Two sets of regression analysis were undertaken to determine the validity of the prediction of independent variables. A noteworthy issue related to the dropout rate, as previously estimated with dropout rate ranging from 20% to 50% at the follow up stages.

This estimation was based on previous studies by Gollan, Gortner and Dobson, (2006) who reported a 20% dropout rate in 24 months follow up and Farmer et al., (2001) reported response rate of 50% with adolescent participants in 10.8 months follow up study. Based on a 12-month follow-up, a dropout rate of 25% was anticipated. However, unfortunately the drop out was greater than anticipated and therefore some modification was considered in the mode of data analysis, attempting to avoid any reduction to impact and outcome. The procedure included multiple regression analysis with stepwise regression analysis to eliminate inadequate and fragmented data.

In order to provide a suitable unified model of path analysis for the identified predictors of psychological wellbeing, a further series of path analyses were performed for both anxiety and depression. The findings and results from these analyses are presented in the next section beginning with multiple regression and test of correlation coefficient as well as test of correlation variance.

6.3 Results and data analysis of depression (PHQ9)

In order to examine the correlation amongst the variables multiple regression analysis was performed to test the predictability of independent variables. The risk was minimised by using the stepwise regression analysis method. This was considered to eliminate the variables with minimal to no power and therefore enabling the focus on the strongest or most significant positive contributors.

6.3.1. Model summary for prediction of depressive symptom at time two

The model summarised in table 6.1 indicates that there were specific variables with higher powers of predictions for depressive presentations (PHQ9). As can be seen in the model summary and correlation scores at time two for PHQ9, represented in table 6.1, Neuroticism results offered an approximation probability of 50% for prediction of depressive symptoms with a value of (r^2*=.50, df=1, F=50.03, p<.001*) and appeared with a statistically significant value of (*β=4.38, t=3.12, p=.003*). Similarly, as anticipated from previous analysis the mastery indicated an approximation probability of 58% with significant values of (r^2*=.58, df=2, F=34.42, p<.000*) and (*β= 20.43, t=3.88, p<.001*) for prediction of depressive symptoms.

Interestingly, DAS success perfectionism showed the greatest predictability score with an approximation percentage of 62% and a significance value of (r^2*=.621, df=1, F=26.22, p<.001*) indicating a statistical value of (*β=14.70, t=2.56, p=.013*). This result was comparable to previous studies (Beck, Perkins, 2004; Moore et al., 2014; Senormanci et al., 2013; Teasdale et al., 2000, 2001).

Table 31 (6.1) Model summary and correlation scores time two

Model	r^2	*df*	*F*	*Sig.*	*B*	*t*	*Sig.*
Neuroticism	.500	1	50.03	.000[b]	4.382	3.12	.003**
Mastery	.584	2	34.42	.000[c]	.254	3.88	.000***
DAS success/perfection	.621	3	26.22	.000[d]	.205	2.56	.013*

** = P<0.05, ** = P<0.01, *** = P<0.001*

6.4 Results and data analysis of anxiety (GAD7)

Similar to previous analysis, a multiple regression analysis was conducted with GAD7 in order to test the correlation and predictability of the independent measures and their association with the psychological wellbeing. A similar sequence of analysis was performed including stepwise regression analysis to eliminate the variables deemed unsuitable due to their lack of power or their lack of significance with the identified variables.

6.4.1. Model summary and correlation for anxiety symptoms at time two

The analysis showed correlations that were statistically significant, producing results with the value of (p<0.000) as it shown in table 6.2. The noteworthy positive contributors were highlighted in table 6.2, including the model summary. Scores of Neuroticism indicated an approximation predictability of 53% with a statistically significance value of (r^2*=.52, df=1, F=57.33, p<.000*) and (*β=3.61, t=3.26, p=.002*) suggesting an indicator for prediction of anxiety based symptoms.

Otherwise, as can be seen in table 6.2, Mastery showed to have an approximation predictability of 60% with values of (r^2*=.60, df=2, F=39.24, p<.000*) and (*β=11.88, t=4.34, p<.000*) that also appears significant and a more relevant predictor for anxiety.

Nonetheless and similar to PHQ9 analysis, the scores of DAS success and perfectionism showed the greatest predictability with an approximation of 65% with a value of (r^2*=.64, df=3, F=30.82, p<.000*) and the statistical significance value of (*β=10.304, t=3.83, p<.000*). This score offers a clear indictor for DAS success and perfectionism as predictors of anxiety symptoms (GAD7).

Table 32 (6.2) Model summary and correlation scores at time 2

Model	r^2	*df*	*F*	*Sig.*	*β*	*t*	*Sig.*
Neuroticism	.524	1	57.33	.000[b]	3.61	3.26	.002**
MAQ	.606	2	39.24	.000[c]	.254	4.34	.000***
Coping Avoidance	.649	3	30.82	.000[d]	.205	3.83	.000***

** = P<0.05, ** = P<0.01, *** = P<0.001*

6.4.2. Summary of multiple regressions

These two regression analyses results of the linear regression scores indicated specific features that could be considered as strong predictors of depression and anxiety. This also could be considered as a suitable predictor for the state of subjective psychological wellbeing. However, further in-depth analysis would offer a detailed account in support of the current findings. The next step required further supplementary evidence in confirmation of the hypotheses and therefore a series of confirmatory factor and path analysis with the same variables were conducted.

6.5 Path analysis for PHQ9 and GAD7

Further enhancement of the previously reported models and analyses were deemed necessary and therefore additional regression analysis along with factor analyses for PHQ9 and GAD7 were performed in a series of combinations. Following the initial analysis, the data gathered from time two was utilised with the same variables. Interesting findings were evident with reference to correlation and covariance of the variables, namely the symbiotic relationship between the selected measures as predictors of depression and anxiety. The next sections will provide a detailed account of a number of significant values and their highlighted scores that produced a good fit with the model. Further analyses and path diagrams associated with this section of the thesis can be found in appendix 6 and 7 for perusal.

6.5.1. CFA and path analysis for the hypothesised models

In order to test the integrity of the hypotheses four specific models were considered at the initials stages. A series of confirmatory analysis were performed followed by regression and covariance analyses with the four postulated models. The confirmatory analysis and models summary for PHQ9 and GAD7 are presented next. Additional associated details such as path diagram and stats relating to these analyses are placed in the appendix 7 for further perusal.

6.5.1.1. Path analysis and summarised models for PHQ9 at time one and time two

A model summary of factor analysis for PHQ9 is shown in table 6.3 with interesting findings across all hypothesised models, notably absent score for BIC was evident and as discussed previously this was due to missing data.

Table 33 (6.3) Path analysis for PHQ9 with four represented model summaries

	Chisq / df	TLI	CFI	RMSEA	AIC
Model 1	23.054/12	.867	.956	.128	87.054
Model 2	16.898/9	.873	.968	.125	86.898
Model 3	10.504/9	.976	.994	.055	80.504
Model 4 with Neuroticism	14.515/10	.935	.988	.090	124.515

Initially, a total of three models were tested as shown in table 6.4 indicating the regression analysis scores of the selected variables (appendix.7).

6.5.1.2. Model for PHQ9 at time one and time two

As can be seen in figure 6.1 below, a model for PHQ9 at time one and time two was drawn and computed. The results suggested that PHQ9 could be predicted by Mastery, MAQ and Attention Globality at time two.

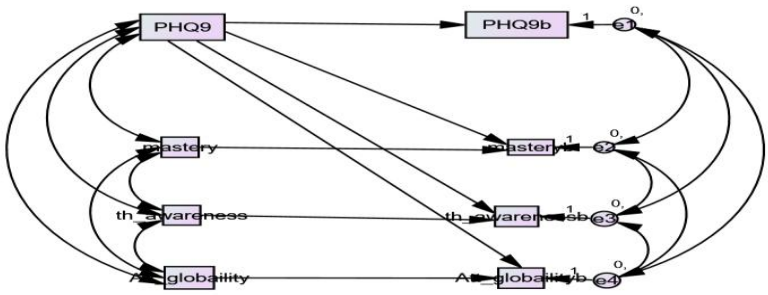


Figure 13 (6.1) PHQ9 predicting PHQ9 at times two, model 3

As can be seen in table 6.1 the correlation amongst the variables produced a stable model for the prediction of PHQ9 at time one and time two, however further improvements were considered and therefore a model with Neuroticism was developed and examined, this model will be discussed later.

6.5.1.3. Regression analysis scores for models 1-3

The reflecting scores shown below in table 6.4, suggests that a gradual and explorative progression development of a suitable model in prediction of PHQ9 at time one and time two. The regression analysis produced here showed a positive correlation amongst the reported scores with all variables with significant values of $p<0.001$.

The results from regression analysis indicated a significant value of p<0.001 for PHQ9 at times one and time two and was comparable to other variables.

Table 34 (6.4) Regression analysis scores for PHQ9 at time one and time two; models 1-3

Model 1			Estimate	S.E.	C.R.	*p*	*B*
Mastery	⇨	Mastery t2	.794	.076	10.401	***	.798
Attention Globality	⇨	Attention Globality t2	.673	.088	7.686	***	.715
MAQ	⇨	MAQ t2	.637	.097	6.596	***	.658
PHQ9	⇨	PHQ9 t2	.841	.069	12.226	***	.851
Model 2							
Mastery	⇨	Mastery t2	.790	.077	10.205	***	.795
Attention Globality	⇨	Attention Globality t2	.671	.088	7.651	***	.713
MAQ	⇨	MAQ t2	.630	.097	6.526	***	.655
PHQ9	⇨	PHQ9 t2	.808	.094	8.606	***	.824
Mastery	⇨	PHQ9 t2	-.021	1.171	-.018	.986	-.002
MAQ	⇨	PHQ9 t2	.085	.064	1.319	.187	.099
Attention Globality	⇨	PHQ9 t2	.128	.075	1.719	.086	.131
Model 3							
Mastery	⇨	Mastery t2	.658	.099	6.667	***	.639
Attention Globality	⇨	Attention Globality t2	.575	.090	6.400	***	.610
MAQ	⇨	MAQ t2	.634	.101	6.304	***	.649
PHQ9	⇨	PHQ9 t2	.872	.070	12.522	***	.860
PHQ9	⇨	Mastery t2	-.021	.008	-2.643	.008	-.260
PHQ9	⇨	MAQ	-.070	.118	-.594	.552	-.062
PHQ9	⇨	Attention Globality	.266	.092	2.894	.004	.281

** = P<0.05, ** = P<0.01, *** = P<0.001*

Scores from this analysis produced a number of interesting finds. As evident, the results suggested a strong predicting quality between time one and time two for the identified variables. Furthermore, as it can be seen in table 6.4, the highest scores for prediction of PHQ9 were found with Mastery, MAQ and Attention Globality.

6.5.1.4. Covariance analysis scores for models 1-3

Further analysis of covariance conducted with the same three identified models and as it can be seen in table 6.5, a significance value of p<0.001 for Mastery and PHQ9 was found across all three reported models.

Table 35 (6.5) Covariance scores for PHQ9

Model 1			Estimate	S.E.	C.R.	*p*	*β*
Attention Globality	⇔	MAQ	3.628	4.799	.756	.450	.106
Mastery	⇔	Attention Globality	-.586	.339	-1.728	.084	-.247
Mastery	⇔	MAQ	.985	.393	2.505	.012	.365
Attention Globality	⇔	PHQ9	11.575	4.394	2.634	.008	.388
MAQ	⇔	PHQ9	-10.111	4.818	-2.099	.036	-.297
Mastery	⇔	PHQ9	-1.591	.383	-4.156	***	-.674
Model 2							
Attention Globality	⇔	MAQ	3.548	4.780	.742	.458	.104
Mastery	⇔	Attention Globality	-.594	.338	-1.760	.078	-.252
Mastery	⇔	MAQ	.980	.392	2.498	.012	.363
Attention Globality	⇔	PHQ9	11.578	4.381	2.643	.008	.389
MAQ	⇔	PHQ9	-10.150	4.817	-2.107	.035	-.299
Mastery	⇔	PHQ9	-1.589	.382	-4.155	***	-.674
Model 3							
Attention Globality	⇔	MAQ	3.703	4.812	.770	.442	.108
Mastery	⇔	Attention Globality	-.572	.340	-1.682	.093	-.241
Mastery	⇔	MAQ	.982	.394	2.492	.013	.363
Attention Globality	⇔	PHQ9	11.480	4.399	2.609	.009	.384
MAQ	⇔	PHQ9	-10.109	4.821	-2.097	.036	-.297
Mastery	⇔	PHQ9	-1.590	.384	-4.146	***	-.673

** = P<0.05, ** = P<0.01, *** = P<0.001*

As can be seen in table 6.5, the predictive indicators between time one and time two demonstrated a gradual increase in their predictive qualities as the model further developed. The highest predictability scores for PHQ9 at time two for the reported models indicated prediction approximation of 64%, 74% and 74% respectively. This analysis suggests that these variables have a covariance relationship, where both dependent and independent variables could predict each other.

6.5.1.5. Model 4: Regression analysis with Neuroticism

The fourth model considered here in table 6.6 tested the regression analysis with Neuroticism as one of the main predictors. A series of regressions reported below with significant values of p<0.001 between time one and time in prediction of depressive symptoms.

Table 36 (6.6) Regression analysis with Neuroticism

			Estimate	S.E.	C.R.	*p*	*B*
Mastery	⇨	Mastery t2	.660	.099	6.644	***	.645
Attention Globality	⇨	Attention Globality t2	.532	.098	5.438	***	.561
MAQ	⇨	MAQ t2	.619	.100	6.164	***	.640
Neuroticism	⇨	Mastery t2	-.007	.005	-1.463	.143	-.168
Neuroticism	⇨	MAQ t2	-.048	.089	-.542	.588	-.086
Neuroticism	⇨	Attention Globality t2	.092	.072	1.270	.204	.189
Neuroticism	⇨	Neuroticism t2	.847	.063	13.513	***	.881
Neuroticism	⇨	PHQ9 t2	.030	.057	.531	.595	.058
PHQ9	⇨	PHQ9 t2	.853	.120	7.107	***	.829
PHQ9	⇨	Mastery t2	-.010	.011	-.935	.350	-.124
PHQ9	⇨	MAQ t2	-.007	.178	-.037	.971	-.006
PHQ9	⇨	Attention Globality t2	.143	.129	1.105	.269	.150
Mastery	⇨	PHQ9 t2	.360	1.161	.310	.756	.028
MAQ	⇨	PHQ9 t2	.107	.064	1.688	.091	.119
Attention Globality	⇨	PHQ9 t2	.110	.081	1.361	.174	.107

** = P<0.05, ** = P<0.01, *** = P<0.001*

6.5.1.6. Covariance analysis of PHQ9 with Neuroticism

Furthermore, covariance analysis produced scores with significant values (see table 6.7) with Attention Globality and Neuroticism showing a strong covariance with value of p<0.001. Similar scores were also evident for Neuroticism and prediction of PHQ9.

Table 37 (6.7) Covariance including Neuroticism

			Estimate	S.E.	C.R.	*p*	*β*
Attention Globality	⇔	MAQ	3.855	4.774	.808	.419	.113
Mastery	⇔	Attention Globality	-.559	.338	-1.656	.098	-.236
Mastery	⇔	MAQ	.989	.394	2.508	.012	.366
Attention Globality	⇔	Neuroticism	30.833	9.054	3.405	***	.530
MAQ	⇔	Neuroticism	-13.054	9.272	-1.408	.159	-.196
Mastery	⇔	Neuroticism	-2.266	.700	-3.238	.001	-.489
Neuro	⇔	PHQ9	44.104	9.807	4.497	***	.758
Attention Globality	⇔	PHQ9	11.398	4.366	2.611	.009	.383
Mastery	⇔	PHQ9	-1.594	.384	-4.149	***	-.673
MAQ	⇔	PHQ9	-10.152	4.817	-2.107	.035	-.299

** = P<0.05, ** = P<0.01, *** = P<0.001*

6.5.1.7. Path diagram for PHQ9 with Neuroticism

Path diagram shown below in figure 6.2, indicating the correlation amongst the previously selected variable with addition of Neuroticism, predicting PHQ9 at time one and time two. The producing results offered the best predictor when compared to scores of other variables in this model.

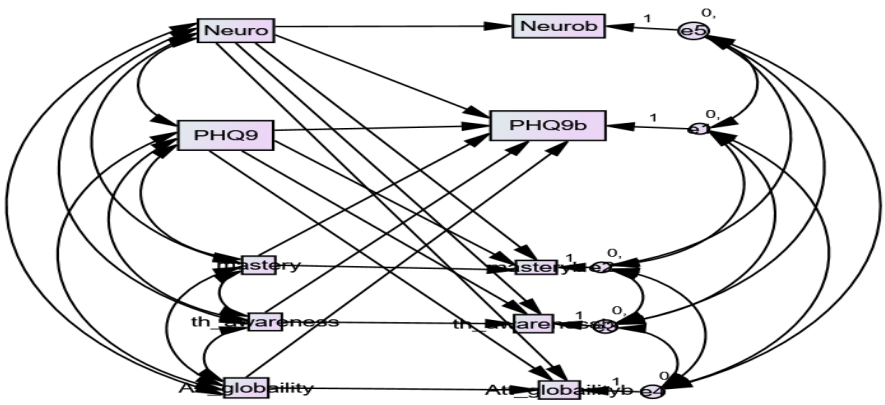


Figure 14 (6.2) prediction of PHQ9 at time one and time with Neuroticism

This model was able to offer the highest scores in predictive quality for prediction of PHQ9 at time two with an approximation of 77%. Notably this path diagram seemed best fit with model at this stage of analyses. However, despite a stable path diagram, the scores for fit with model were not suitable and therefore further analysis was considered essential, which will be discussed later on in this chapter.

6.5.2. CFA for GAD7 time one and time two models

Further confirmatory factor analyses were conducted with all four hypothesised models shown in table 6.8. Number of scores in the model summary produced a good model fit. Although, yet again the absence of BIC scores was evident and this could be explained by the limitation in computed data.

Table 38(6.8) Path analysis for GAD7 with four represented model summaries

	Chisq / df	TLI	CFI	RMSEA	AIC
Model 1	17.553/12	.928	.976	.091	81.553
Model 2	7.386/9	1.028	1.000	.000	77.386
Model 3	12.837/9	.934	.983	.087	82.837
Model 4 with Neuroticism	11.721/10	.975	.995	.055	121.721

A similar further analysis were undertaken with GAD7 that included three models as shown in table 6.9 indicating the regression analysis scores of the selected variables. The scores reflected on the changes in model and the progression made in their suitability as predictors of GAD7 at time one and time two.

6.5.2.1. Path diagram for GAD7 at time one and time two

As can be seen below in figure 6.3, path diagram for GAD7 at time one and time two was developed and computed. The positive correlations of covariance between GAD7 at time one and time two was also evident.

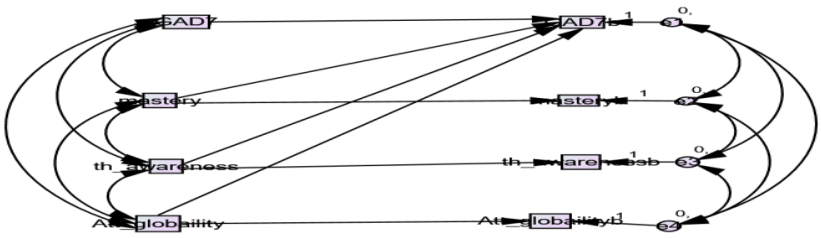


Figure 15 (6.3) GAD7 predicting GAD7 at times two, model 3

Interestingly, a reverse predictive relationship was also notable between GAD7 and other variables where GAD7 could predict Mastery, MAQ and Attention Globality at time two. This suggested a covariance relationship that also supported the initial hypotheses that the anxiety based presentations could be predicted using specific cognitive tools. The regression analyses for time one and time two with the three hypothesised models are presented next.

6.5.2.2. Regression analysis for GAD7 at time one and time two with model 1-3

The regression analysis produced correlations amongst some measures with significant values of p<0.001, indicating comparable results to previous analyses for GAD7 at times one and time two.

Table 39 (6.9) Regression analysis scores for GAD7at time one and time two; models 1-3

Model 1			Estimate	S.E.	C.R.	*p*	*β*
GAD7	⇨	GAD7 t2	.741	.066	11.304	***	.831
Mastery	⇨	Mastery t2	.786	.078	10.102	***	.789
Attention Globality	⇨	Attention Globality t2	.676	.088	7.660	***	.713
MAQ	⇨	MAQ t2	.634	.095	6.673	***	.655
Model 2							
GAD7	⇨	GAD7 t2	.779	.068	11.532	***	.845
Mastery	⇨	Mastery t2	.702	.097	7.234	***	.681
Attention Globality	⇨	Attention Globality t2	.570	.095	6.023	***	.598
MAQ	⇨	MAQ t2	.618	.097	6.394	***	.632
GAD7	⇨	Mastery t2	-.020	.009	-2.124	.034	-.207
GAD7	⇨	MAQ t2	-.179	.133	-1.344	.179	-.139
GAD7	⇨	Attention Globality t2	.301	.113	2.674	.008	.272
Model 3							
GAD7	⇨	GAD7 t2	.641	.088	7.311	***	.722
Mastery	⇨	Mastery t2	.788	.079	10.017	***	.789
Attention Globality	⇨	Attention Globality t2	.676	.088	7.650	***	.714
MAQ	⇨	MAQ t2	.626	.097	6.464	***	.651
Attention Globality	⇨	GAD7 t2	.141	.064	2.195	.028	.184
MAQ	⇨	GAD7 t2	-.002	.054	-.032	.975	-.003
Mastery	⇨	GAD7 t2	-.291	.934	-.312	.755	-.030

** = P<0.05, ** = P<0.01, *** = P<0.001*

Similarly, as can be seen in table 6.9, the scores of Mastery, MAQ and Attention Globality in the second and third models produced interesting findings. Further observation included the weight regression scores that were similar to PHQ9 scores on all the reported models.

6.5.2.3. Covariance analysis for GAD7 at time one and time two

As shown in table 6.10, other results for GAD7 at time one and time two indicated a number of covariance predictors between the reported variables with significant values of P<0.001.

Table 40 (6.10) Covariance scores for GAD7 at time one and time two

Model 1			Estimate	S.E.	C.R.	*p*	*β*
Attention Globality	⇔	MAQ	3.801	4.769	.797	.425	.112
Mastery	⇔	Attention Globality	-.606	.337	-1.799	.072	-.258
GAD7	⇔	Attention Globality	11.762	3.894	3.021	.003	.458
Mastery	⇔	MAQ	.948	.390	2.432	.015	.353
GAD7	⇔	MAQ	-6.745	4.125	-1.635	.102	-.230
GAD7	⇔	Mastery	-1.262	.324	-3.894	***	-.622
Model 2							
Attention Globality	⇔	MAQ	3.909	4.793	.816	.415	.115
Mastery	⇔	Attention Globality	-.587	.338	-1.735	.083	-.249
GAD7	⇔	Attention Globality	11.803	3.910	3.019	.003	.459
Mastery	⇔	MAQ	.954	.391	2.438	.015	.355
GAD7	⇔	MAQ	-6.664	4.127	-1.615	.106	-.227
GAD7	⇔	mastery	-1.250	.324	-3.858	***	-.615
Model 3							
Attention Globality	⇔	MAQ	3.846	4.765	.807	.419	.113
Mastery	⇔	Attention Globality	-.616	.336	-1.831	.067	-.262
GAD7	⇔	Attention Globality	11.696	3.880	3.014	.003	.456
Mastery	⇔	MAQ	.946	.390	2.427	.015	.352
GAD7	⇔	MAQ	-6.700	4.127	-1.623	.105	-.229
GAD7	⇔	Mastery	-1.257	.324	-3.883	***	-.620

** = P<0.05, ** = P<0.01, *** = P<0.001*

The reported data indicated predictive qualities between time one and time two amongst all the variables. The highest predictability scores for GAD7 at time two for approximation in prediction of anxiety symptoms was 69% with the first model, 71% with the second and 70% with the third model. Interestingly, the main observation extracted from this analysis and covariance analysis with PHQ9 would suggest a symbiotic relationship between most identified predictors, the findings could be considered as further evidence in support of the hypotheses where the psychological wellbeing could be monitored and predicted using the selected cognitive measures.

6.5.2.3. Model 4: Regression analysis with Neuroticism

Similar to the regression analysis for PHQ9, this stage of regression analysis considered the inclusion of Neuroticism in the prediction of GAD7. As can be seen in table 6.11, a number of positive regression scores were reported with significant values of p<0.001 between time one and time two.

Table 41 (6.11) Regression for GAD7 with Neuroticism

			Estimate	S.E.	C.R.	*p*	*β*
GAD7	⇨	GAD7 t2	.585	.123	4.761	***	.638
Mastery	⇨	Mastery t2	.723	.095	7.619	***	.702
Attention Globality	⇨	Attention Globality t2	.532	.098	5.405	***	.558
MAQ	⇨	MAQ t2	.592	.096	6.160	***	.616
GAD7	⇨	Mastery t2	.004	.014	.269	.788	.040
GAD7	⇨	MAQ t2	-.307	.232	-1.323	.186	-.240
GAD7	⇨	Attention Globality t2	.099	.175	.567	.571	.090
Attention Globality	⇨	GAD7 t2	.117	.065	1.815	.070	.149
MAQ	⇨	GAD7 t2	-.022	.052	-.417	.677	-.031
Mastery	⇨	GAD7 t2	-.188	.886	-.212	.832	-.019
Neuroticism	⇨	GAD7 t2	.055	.052	1.059	.289	.136
Neuroticism	⇨	Mastery t2	-.011	.006	-1.966	.049	-.266
Neuroticism	⇨	MAQ t2	.055	.101	.548	.584	.099
Neuroticism	⇨	Attention Globality t2	.112	.080	1.402	.161	.232
Neuroticism	⇨	Neuroticism t2	.848	.062	13.628	***	.883

** = P<0.05, ** = P<0.01, *** = P<0.001*

Similar to the previous analysis, the covariance analysis of GAD7 included the inclusion of Neuroticism that is being presented next.

6.5.2.4. Covariance analysis for GAD with Neuroticism

Similar to previous analysis of the covariance, scores with significant values were noted below in table 6.12. Attention Globality and Neuroticism, Mastery and GAD7 as well as Neuroticism and GAD7 showed the strongest covariance affiliations with value of p<0.001, indicating the prediction approximation of 73% for GAD7.

Table 42 (6.12) Covariance including Neuroticism

			Estimate	S.E.	C.R.	*p*	*β*
Attention Globality	⇔	MAQ	3.936	4.787	.822	.411	.116
Mastery	⇔	Attention Globality	-.596	.338	-1.763	.078	-.252
GAD7	⇔	Attention Globality	11.849	3.884	3.051	.002	.462
Mastery	⇔	MAQ	.961	.393	2.443	.015	.355
GAD7	⇔	MAQ	-6.307	4.117	-1.532	.126	-.215
GAD7	⇔	Mastery	-1.255	.324	-3.872	***	-.617
Attention Globality	⇔	Neuroticism	30.894	9.076	3.404	***	.529
MAQ	⇔	Neuroticism	-12.526	9.317	-1.344	.179	-.187
Mastery	⇔	Neuroticism	-2.258	.700	-3.226	.001	-.487
GAD7	⇔	Neuroticism	41.273	8.801	4.689	***	.820

** = P<0.05, ** = P<0.01, *** = P<0.001*

6.5.2.5. Path diagram for GAD7 at time one and time two with Neuroticism

Path diagram shown below in figure 6.4, indicates the prediction of GAD7 at time one and time two with the addition of neuroticism. Moreover, similar to scores for prediction of PHQ9, GAD7 scores with Neuroticism produced a stronger prediction approximation score.

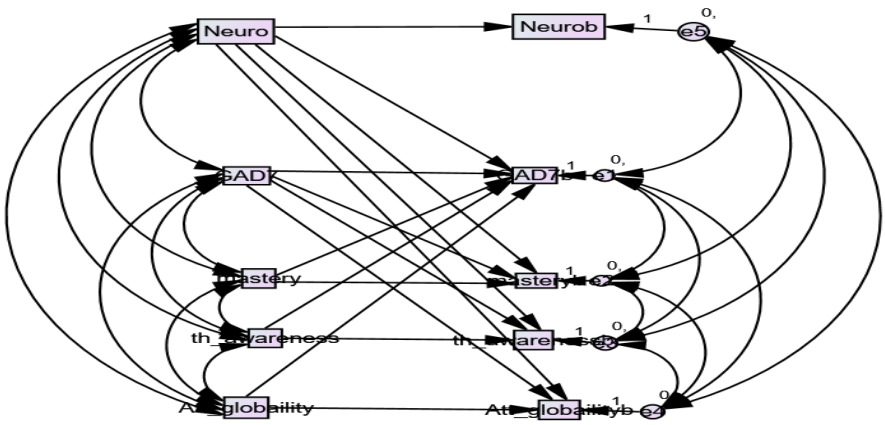


Figure 16 (6.4) prediction of PHQ9 at time one and time with Neuroticism

Although the reported models produced reasonable scores following the confirmatory and regression analysis, shortfalls and limitation for model fit and lack of scores for BIC also was evident. Therefore further analysis was considered in order to provide a more suitable model in the prediction of PHQ9 and GAD7. Furthermore, additional considerations were given to the role of mediators and moderators in prediction of anxiety and depression. The current phase of this study reflected on the analyses undertaken in chapter four by examining the role of moderation and moderation effect, similar to the study by Oei et al (2006).

Additional analyses were conducted, considering variables as moderator and mediators, these examples have been placed in appendix 7 for perusal. These further analyses provided the grounding for the next stage in development and application of the path analysis combining all the previous findings. Therefore the review of analyses, the development and application of path analysis for PHQ9 and GAD7 will be discussed next.

6.6 Path analysis (PHQ9 at time two)

Path analysis in this section adopted a similar methodological approach to the pilot and the main phase of the study, which were reported in chapters five and six. In order to achieve the desired outcome a regression and path analysis was conducted, that is shown in table 6.3, indicating linear regression across all variables and their association with depressive symptoms (PHQ9) at time one and time two. A notable adjustment included in this analysis refers to the modification of the coping variable. The coping variable was divided into two factors; active and passive (non-active) coping styles. This consideration and one amendment were due to the lack of power scores during the analysis. Interestingly, the change in representation had enabled and enhanced the role of the sub factors of coping in the prediction of psychological wellbeing. Results from this analysis indicated that neuroticism predicted DAS-24 with a statistically significant value of (*β=.776, P<.001*), and similar predictions were noted with ASQ scores and DAS-24 with a significant value of (*β=.783, P<.001*). Moreover, Mastery predicted DAS-24 with the statistical value of (*β=-.548, p<.001*) and PHQ9 and mastery showed a significant correlation with the value of (*β=-.395, P<.001*). The other notable correlation was amongst neuroticism predicting PHQ9 (*β=.595, p<.001*) and as expected PHQ9 at time one predicting PHQ9 at time two with the statistical value of (*β=.862, p<.001*).

6.6.1. Results of path analysis for PHQ9 at time two

The results seen in table 6.13, demonstrates the prediction of depressive symptom scores across a number of variables in time one and time two. The correlation between higher-order factors were analysed indicating both total and sub factor scores ability to predict PHQ9 at time two.

Results here highlighted that PHQ9 was correlated and therefore was predicted by a number of variables such as DAS-24 and Neuroticism.

Table 43 (6.13) Path analysis across independent variables of PHQ9 at time two

			Estimate	S.E.	C.R.	*p*	*β*
Neuroticism	⇨	DAS total	.864	.089	9.65	***	.776
DAS total	⇨	Attention total	.868	.155	5.58	***	.783
DAS total	⇨	Mastery	-.021	.006	-3.34	***	-.548
Attention total	⇨	Mastery	-.003	.005	-.665	.506	-.092
DAS total	⇨	MAQ	-.120	.088	-1.36	.173	-.218
Attention total	⇨	MAQ	.034	.082	.415	.678	.068
Mastery	⇨	Coping active	.464	.326	1.42	.155	.204
Mastery	⇨	Coping Inactive	.117	.413	.282	.778	.039
MAQ	⇨	Coping active	-.001	.019	-.075	.940	-.009
MAQ	⇨	Coping inactive	.036	.029	1.26	.205	.176
Attention total	⇨	Coping active	-.021	.012	-1.77	.076	-.266
Neuroticism	⇨	Coping active	-.010	.015	-.694	.487	-.105
MAQ	⇨	PHQ9	-.024	.064	-.385	.700	-.030
Attention total	⇨	PHQ9	-.014	.040	-.364	.716	-.036
DAS total	⇨	PHQ9	-.020	.056	-.359	.720	-.045
Mastery	⇨	PHQ9	-4.652	1.14	-4.05	***	-.395
Coping inactive	⇨	PHQ9	-.144	.279	-.517	.605	-.037
Coping active	⇨	PHQ9	-.290	.406	-.714	.475	-.056
Neuroticism	⇨	PHQ9	.295	.058	5.10	***	.595
PHQ9	⇨	PHQ9 t2	.886	.067	13.29	***	.862

** = P<0.05, ** = P<0.01, *** = P<0.001*
Predicting=⇨

Other noteworthy findings included predictability of DAS and ASQ with a value of (*β=.783, p<.000*), when neuroticism predicted DAS with a significant value of (*β=.776, p<.000*) and finally, PHQ9 at time one predicting PHQ9 at the time two with the value of (*β=.862, p<.000*).

6.6.2. Model summary for PHQ9 at time two

As it can be seen in table 6.4 a path analysis and model summary is represented with the predictors of PHQ9 at time two. The statistical value was an exact fit with the model (*χ^2= 13.68, df=12, p=.322, CFI=.99, RMSEA=.046 and AIC=97.68*) offering an approximation of 74% predictability for PHQ9 at the time two.

Table 44 (6.14) Path analysis model summary for PHQ9 at time 2

Model	χ^2	Df	*P*	CFI	RMSEA	AIC
	13.68	12	.322	.99	.46	97.68

Interesting, similar to previous findings the greatest predictor for PHQ9 at time two was reported by Neuroticism. The regression weight and direction of linear regression shown here in figure 6.5, indicates the *β* values across all variables. The β values between some variables are negatively correlated suggesting their paradoxical correlation, meaning an increase in one variable dictates a reduction in another. Also some low scores evident as to their role appear less relevant at this stage of appraisal and reappraisals of stimuli.

6.6.3. the hypothesised model for PHQ9 at time two

The hypothesised model and Path analysis diagram for PHQ9 at time two

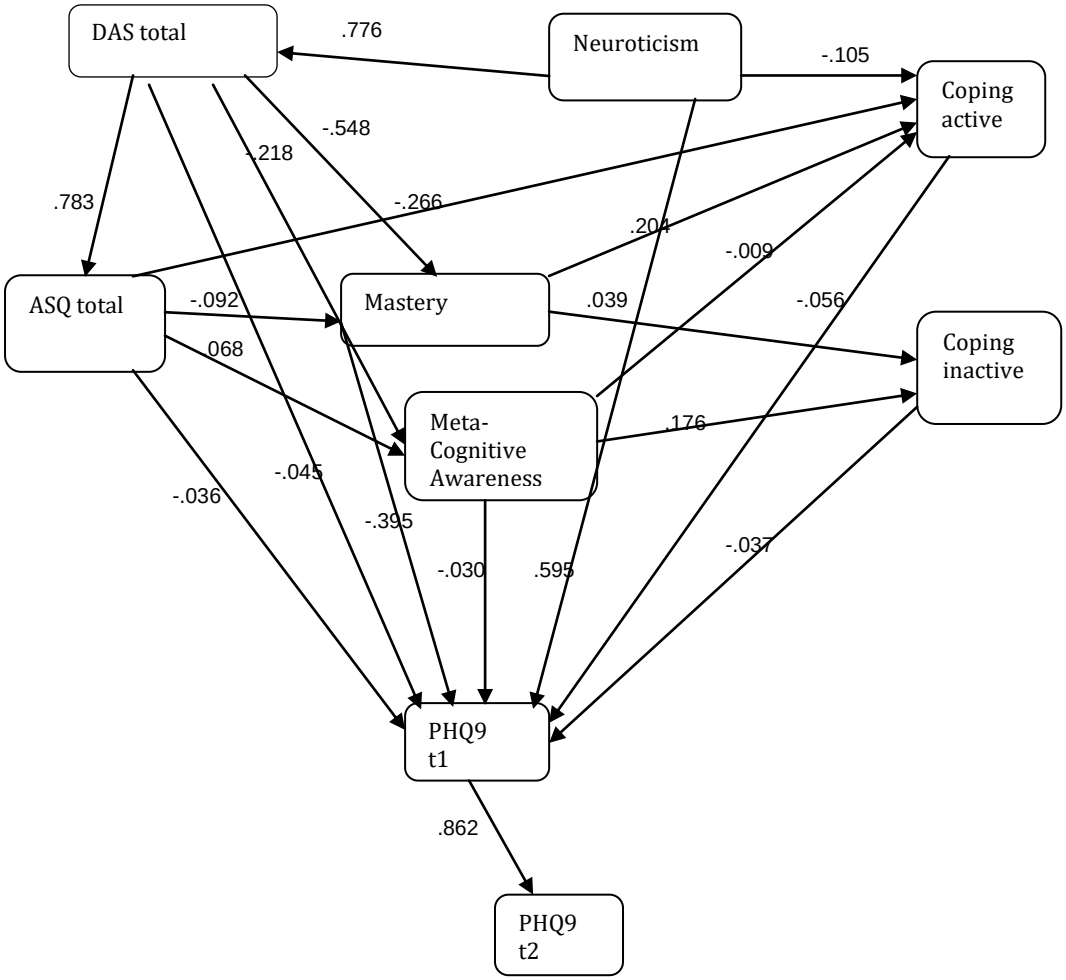


Figure 17 (6.5) Path coefficient for theoretical prediction of PHQ9 time two with *β* value

6.7. Path analysis (GAD7at time two)

Similar to the previous section, regression and path analyses were conducted in this stage as shown in table 6.15, linear regression across all variables and their association with anxiety symptoms (GAD7) at time one and two. As it can be seen in table 6.15, the Neuroticism predicting DAS-24 was statistically significant with a value of (*β= .639, P<.001*).

Other important scores included DAS24 and ASQ shown to have a statistically significant value of (*β=.731, P<.001*). Unsurprisingly, Neuroticism correlation with GAD7 at time two was significant with a value of (*β=.672, P<.001*). Similar correlation effect was witnessed between GAD7 at the time one and GAD7 at time two with a value of (*β=.844, P<.001*).

6.7.1. Regression analysis for GAD7 at time two

Results shown in table 6.15 demonstrate the prediction of GAD7 by a number of variables. The most significant variables included DAS-24, Neuroticism and GAD7 at time one predicting GAD7 at the time two. Other notable variable interactions included Neuroticism and DAS-24 with value of (*β=.639, p<.000*).

Table 45 (6.15) Regression analysis across independent variables GAD7 at time two

			Estimate	S.E.	C.R.	*p*	*β*
Neuroticism	⇨	DAS total	.708	.095	7.459	***	.639
DAS total	⇨	Mastery	-7.25	2.295	-3.161	.002	-.269
DAS total	⇨	Attention total	.814	.149	5.484	***	.731
DAS total	⇨	MAQ	-.085	.087	-.977	.328	-.154
Attention total	⇨	MAQ	.049	.078	.628	.530	.098
Mastery	⇨	Coping active	.411	.330	1.247	.212	.176
Mastery	⇨	Coping inactive	.184	.412	.445	.656	.059
MAQ	⇨	Coping active	.002	.019	.086	.931	.010
MAQ	⇨	Coping inactive	.034	.028	1.238	.216	.167
Attention total	⇨	Coping active	-.022	.011	-2.014	.044	-.289
Neuroticism	⇨	Coping active	-.010	.014	-.711	.477	-.104
MAQ	⇨	GAD7	.000	.050	.007	.994	.001
Attention total	⇨	GAD7	.040	.031	1.273	.203	.114
DAS total	⇨	GAD7	-.007	.045	-.151	.880	-.017
Mastery	⇨	GAD7	-2.98	.911	-3.278	.001	-.283
Coping inactive	⇨	GAD7	-.046	.225	-.204	.838	-.014
Coping active	⇨	GAD7	.447	.330	1.355	.176	.099
Neuroticism	⇨	GAD7	.291	.046	6.377	***	.672
GAD7	⇨	GAD7 t2	.786	.064	12.244	***	.844

** = P<0.05, ** = P<0.01, *** = P<0.001*
Predicting= ⇨

6.7.2. Model summary for GAD7 at time two

As it can be seen in table 6.16 represents the model summary of the prediction for GAD7 at the time two, which provided an excellent fit with the model. The statistical significance noted with the values of (*χ^2= 13.10, df=13, p=.44, CFI=1.0, RMSEA=.011 and AIC=95.10*) offering an approximation probability of 71% predicted anxiety symptoms (GAD7) at the time two.

Table 46 (6.16) Model fit summary for GAD7 at time two

Model	χ^2	df	*P*	CFI	RMSEA	AIC
	13.10	13	.440	1.00	.011	95.106

The regression weight and direction of linear regression is shown in figure 6.6, with the *β* values across all variables are represented, offered similar reading to PHQ9 scores. The negatively scores of the *β* values suggesting a paradoxical relationship with one another, also some scores appeared minimal and negligible in offering a substantial conclusion in prediction of GAD7 at time two.

6.7.3. Path diagram for GAD7 at time two

Hypothesised model and path analysis diagram for GAD7 at time two

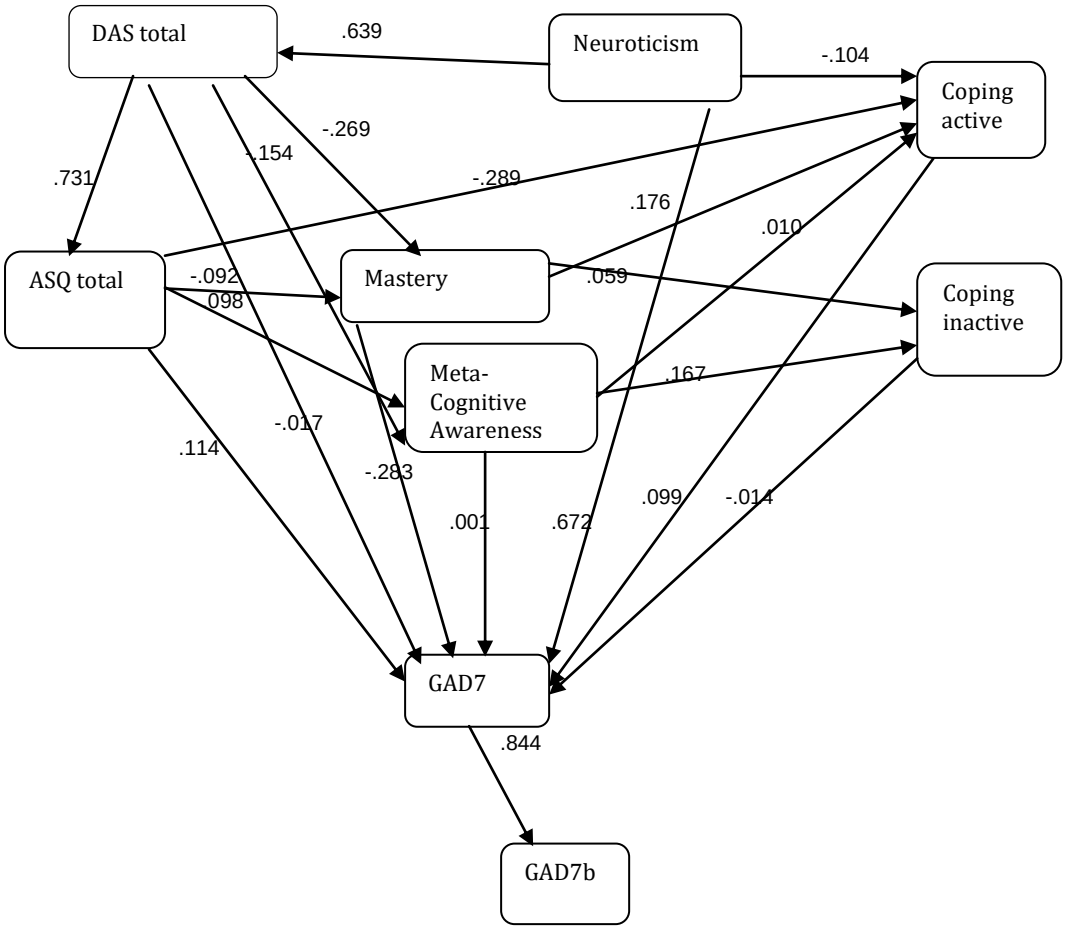


Figure 18 (6.6) Path coefficient for theoretical prediction of GAD7 time two with *β* value

Further analyses were conducted where coping scores were removed from the equation and these are discussed next.

6.8. Path analysis with no coping variable for PHQ9 at time two

Further regression analysis of the independent and dependent variables of PHQ9 and GAD7 at time two were conducted. This path analysis considered the deduction of coping from the model in order to examine the potential for improvement in overall model by developing a more statically significant path diagram. Data was computed accordingly where the predictive data for PHQ9 at time two provided an excellent fit with the model (*χ2 =9.76, df=7, p=.202, CFI=.99, RMSEA =.078, AIC=65.76*) for PHQ9. Results produced a statistically significant value (*β=.861, p<.001*) as predictors of PHQ9 at time two. The main findings included the predictive quality of Mastery, indicating PHQ9 at time two with a value of (*β=-.384, p<.001*) and as previously discovered Neuroticism indicated a significant value of (*β=.595, p<.001*).

6.9. Model summary for PHQ9 and GAD7 at time two without coping

Surprisingly, this equation of regression in assessment of the predictive quality of GAD7 at time two provided an exact fit with the model (χ2=7.23, df=7, p=.405, CFI=.99, RMSEA=.023, AIC=63.23). Furthermore, the result offered an approximation probability of 71% in prediction of GAD7 at time two. The regression results for GAD7 at time two shown to have a significant with a value of (β=.845, p<.001) represented in two path diagram for perusal in appendix 8 and 9.

The main findings in this analysis noted for mastery with a value of (β=-.278, p<.001) and neuroticism with a value of (β=.678, p<.001), predicting anxiety symptoms (GAD7) at time two. In addition, mastery (β=-.274, p<.001) and neuroticism (β=.636, p<.001) predicted DAS-24. Similar, correlations were noted between DAS-24 that predicted ASQ with significant value of (β=.754, p<.001). However, MAQ did not provide a suitable score in this analysis as a predictor or mediator of anxiety for GAD7 at time two unlike reports indicated in the study by Wells, (2008).

6.9.1 Path analysis for PHQ9 and GAD7 at time two without coping

Further path analysis of correlation was conducted with coping being omitted. Surprisingly, results indicated a better fit with the model. The path model was designed and computed similar to previous experimentations (see figures a.1 and, a.2; appendix 8 and 9). The better model fit here could be explained by the fact that individuals utilise coping strategies after the distress is registered and mechanism of response has been initiated. Reflecting on Richard Lazarus's proposition with regards to primary and secondary appraisals, coping is lagged behind and therefore in absence of appraisal of the distress, no coping strategy will be initiated or utilised. However, where an individual is exposed to a distress, then coping predictors play a greater role in reappraisals of the stimuli and therefore adaptation of an appropriate response. The confirmatory observation for this understanding could be tested within the clinical population and compared with non clinical samples. Additionally, as it can be seen in tables 6.17 and 6.18, analyses of the correlations were conducted for PHQ9 at time one and time two. This analysis was repeated with GAD7 at time one and time two. These results could be further explored and investigated that may provide additional support for the previously held hypotheses.

Table 47 (6.17) Path analysis score for squared multiples correlation scores for PHQ9

Measures	Squared Multiple Correlations t1	Squared Multiple Correlations t2	Squared Multiple Correlations t2 no cope
DAS total	.000***	.603	.000***
Attention total	.000***	.326	.654
MAQ	.115	.034	.342
Mastery	.263	.379	.025
Cope in active	-	.038*	-
Coping active	-	.223	-
PHQ9	.546	.705	.696
PHQ9 t2	-	.743	.742

** = P<0.05, ** = P<0.01, *** = P<0.001*

Table 48 (6.18) Path analysis score for squared multiples correlation scores for GAD7

Measures	Squared Multiple Correlations t1	Squared Multiple Correlations t2	Squared Multiple Correlations t2 no cope
DAS total	-	.000***	.000***
Attention total	-	.651	.652
MAQ	-	.340	.349
Mastery	-	.027*	.028*
Cope in active	-	.038*	-
Coping active	-	.223	-
GAD7	-	.757	.750
GAD7 t2	-	.712	.713

** = P<0.05, ** = P<0.01, *** = P<0.001*

6.10. Summary of Longitudinal Analyses

This phase of the study adopted a longitudinal methodological approach in analysis of dependent variables of PHQ9 and GAD7 at two time points. Notable concern included the dropout rate that was greater than 20% as reported by previous studies (Gollan, Gortner and Dobson, 2006). This shortfall had a significant impact on the expected results and therefore the result could not have provided a suitable confirmatory outcome.

The characteristic make up of participants were distributed with (n=57) of the respondent female (n=48) with 82.5% and (n=09) male recording 17.5% respectively with average age range of 37. The ethnic compositions of the participants were simplified to previous parameters of Caucasian (n=50); Black minority (n=0) and Other Minorities (n=11) who had completed the responses.

In spite the shortfall from a number of respondents for the longitudinal data analysis, results were significant to report. The results indicated that PHQ9 at time two correlated with other variables with statistically significant scores across the variables. The model summary and correlation scores at time two for PHQ9 shown in table 6.1, indicated DAS success perfectionism with the greatest predictability scores with an approximation percentage of 62% with significance value of (r^2*=.621, df=1, F=26.22, p<.001*) indicating a statistical value of (*β=14.70, t=2.56, p=.013*). This result outcome was comparable to previous studies suggesting DAS could predict depressive symptoms (Beck, Perkins, 2004; Moore et al., 2014; Senormanci et al., 2013; Teasdale et al., 2000, 2001). Other notable scores was detected for Mastery where an approximation of predictability of 58% with value of (r^2*=.58, df=2, F=34.42, p<.001*) offered a statistical significant value of (*β= 20.43, t=3.88, p<.000*) in prediction of PHQ9 at time two.

Similar correlations were noted for prediction of GAD7 at time 2 with neuroticism as it was reflected on the results in table 6.2 that suggested an approximation of 53% predictability of variance with value of (r^2*= .52, df=1, F=57.33, p<.001*) offering a statistically significant value of (*β=*3.61*, t=3.26, p=.002)*.

Mastery also produced an approximation probability of 60% in prediction of variable of GAD7 at time 2 with value of (r^2*=.60, df=2, F=39.24, p<.001*) with a statistical significance value of (*β=11.88, t=4.34, p<.001*). Interestingly, DAS success and perfectionism showed the highest probability predictor score for GAD7 with 65% at time 2 (r^2*=.64, df=3, F=30.82, p<.001*, *β=10.304, t=3.83, p<.001*).

However, lack of data at time two instigated further concern and In order to address the possible shortfall a suitable model deemed essential that could be statistically significant. Therefore a series of multiple regression and confirmatory factor analysis was conducted, as well as analysis of covariance with four postulated models. The confirmatory analysis and models summary for PHQ9 and GAD7 were reviewed and summarised.

Following the confirmatory analysis and examination of covariance of variables, the highest predictor for PHQ9 at time two showed 64%, 74% and 74% in approximation of prediction for models one to three respectively. Interestingly, Neuroticism showed the highest predictive quality with prediction approximation of 77% for PHQ9 at time 2. Similar investigation with GAD7 indicated predictive qualities between time one and time two with the highest predictability of 69%, 71% and again 70% in approximation of prediction for three models respectively. Moreover, strong correlation noted between Attention Globality and Neuroticism, Mastery and GAD7 as well as Neuroticism and GAD7 showing a strong covariance with value of $p<0.001$. This analysis suggested the prediction approximation of 73% for GAD7.

Findings in these four hypothesised models did not produce the BIC score that was deemed due to limitation of data set. The fourth factor analysis included Neuroticism that offered a better statistical significance and therefore the role of moderator and mediators were re-examined to establish a better model that could explain the internal relational features of the reported variables. The current phase of this study considered mediation and moderation effect similar to the study by Oei et al (2006).

Further analysis of correlation and regression was conducted utilising path analysis. A hypothesised model was tested producing a number of positive and negative correlations with PHQ9 and GAD7 at time two. Mastery, DAS-24 and ASQ appeared to have greater affiliation with both variables. The model summary produced an excellent fit that was statistically significant with values of (χ^2= *13.68, df=12, p=.322, CFI=.99, RMSEA=.046 and AIC=97.68*) indicating an approximation of prediction at 74% for PHQ9 at time two.

Furthermore, neuroticism offered the greatest predictive correlation in prediction of anxiety symptoms (GAD7) at time two with an excellent fit model. Further path analysis of GAD7 at time 2 produced a significant statistical values of (χ^2= *13.10, df=13, p=.44, CFI=1.0, RMSEA=.011 and AIC=95.10*) that offered an approximation probability of 71% for prediction of anxiety at time two (GAD7). Further, path analysis was conducted without coping that offered a better model fit with the model as it can be seen in table 6.17 and 6.18. Although the results and the model fit (appendix.9 and.10) were considered as a positive finding, lack of large data set minimised the potential for this investigation.

Close scores amongst all variables were evident in this investigation. The similarities between correlations and regressions across a number of variables were unexpected. Otherwise as expected all selected measures produced an excellent reliability with significant Cronbach α throughout, in the studies previous and the current one. In spite the positive findings from the qualitative studies, the lack and limitation in number of data, created a cause for concern with regards to the reported findings. Therefore an additional investigation was adopted in addressing the possible shortfalls. Following a review and discussion with supervisory team a qualitative approach was considered and conducted.

The main rationale for considering a qualitative study included the lack of adequate data sets, namely within the longitudinal section where the hypotheses in previous chapters could be more rigorously tested and confirmed. In addition, the qualitative investigation offers a different perspective in conformation of the hypotheses. Therefore, a qualitative method of research was developed and conducted and is presented in the next chapter.

Chapter Seven: Framework Analysis - Clinicians' Views of Cognitive Measures used in Depression and Anxiety

7.1 Overview of Qualitative analysis

In the previous chapters this study employed qualitative methods in order to examine the use of cognitive measures as predictors of psychological wellbeing. Previous discussion has highlighted the complexity and multifactorial nature of psychological wellbeing, which results in the lack of a precise understanding of the cause and effect in general population. The array of variability in determining the cause and effect of psychological wellbeing seems an unproductive mode of examination. Understanding the impact of variability and their relationship, however, is crucial in sustaining a healthy and well-balanced psychological wellbeing. This approach requires a greater recognition of cognitive markers and processes, which could enable an individual to recognise and act on their identified concern, as well an ability to recognise that, at times, they may need to seek additional support.

The naturalistic mode of response in an individual is to continue with the experience and not necessarily recognise or address the identifying marker of distress at its earliest stage, which can lead to experiences such as symptoms of stress, anxiety or depression. Where the cause is an increase in the level of symptom presentation, an individual may seek support. Similarly, as previously highlighted, there is a lack of effective intervention in some cases, especially in terms of dealing with risk of depressive relapse. The main question remains: what contributes to the selection of interventions based on a symptom presentation in order to achieve a state of psychological wellbeing? In other words, how clinicians approach symptom presentation is subjectively based and relates to their clinical expertise, training modality and current evidence-based approaches.

In addition, reviewing the past and current research into clinical and non-clinical populations has provided a plethora of information, assisting the development of this framework whilst considering a suitable theoretical rationale and short falls that should be avoided.

For example one observation has been the fact that the majority of administered measures utilised within research methodology are self-reported measures. This approach has been synonymous with assessment and research in psychological wellbeing. Thematic analysis has been considered as being focused on analysing the data based on a theory-driven approach (Joffe and Yardley, 2004). A recent publication (Chambers et al., 2015) considered the qualitative methodological approach in order to examining self-management of long-term depression. Its authors undertook semi-structured interviews with clinical participants who considered four superordinate themes: namely, experience of depression, the self, wider environment and self-management strategies.

It is noteworthy that a study by Karina Lovell and colleagues (2014) undertook a mixed method study approach, whereby (n=117) service users were recruited to 11 focus groups offering wellbeing intervention. In this study, PHQ9 and GAD7 was administered along with other measures as part of pre- and post-intervention, as well as considering a narrative thematic analysis of the facilitator's views and their experiences of taking part. The latter methodological approach is not too dissimilar to the current model of analysis, where quantitative data were gathered at different times, with the addition of thematic analysis of the clinician's view about offering interventions to clients.

It is postulated that the desired supportive outcome of the aforementioned hypothesis could be achieved by examining the clinician's view in relation to the primary and secondary appraisals. The process of inclusion was simplified to accommodate the desired outcome where clinical opinions were examined. The clinician's view on cognitive measures was explored in order to gather information on the measures utilities in clinical settings. Additionally, the main component of the study intended to gather narrative information about the features that influence or maintain depressive or anxiety states. Clinicians were invited to take part in this study, where their opinion about the relationship between cognitive measures utilised in this study and their clinical observation was sought.

This part of the study adopted a qualitative research methodology, considering thematic analysis and using the framework analysis in order to establish a hypothesis that supported evidence for the previously tested quantitative research. The contrast between the view of the non-clinical participants and the clinician's about working with psychologically distress population would provide a more comprehensive explanation of this study's position and theoretical explanation. Using thematic analysis is useful in developing a generic understanding of the core characteristics of the topic (Braun and Clarke, 2006), which also offers additional benefits such as flexibility in research.

Although thematic analysis is a method of identifying, analysing and reporting themes in the reported data sets, the actual process should be able to offer a wider range of information. For example, practitioners' views were extracted and examined in a number of studies utilising qualitatively based rationale (Howarth et al., 2014; Spendelow, 2015; Railton and Mowat, 2000; Isaac et al., 2010), which were similar in terms to of process to the current study. These qualitative studies examined the view of clinicians, such as counsellors and general practitioners, in relation to depression, service provision and mode of intervention.

Although the research findings have been based on assessment methodology a degree of caution should be considered due to other variables such as personal interpretation of wellbeing and filtering of information due to internal evaluative processes (Galen et al., 2013). It is, therefore, reasonable to be attentive with regards to probability of errors, some of which are instigated by cognitively or emotionally biased errors. Having considered the potential for errors, the main objective of this adjunct study included the examination of the features of wellbeing and its variables, where clinicians engage with when planning and developing a rational for treatment.

This enables the process to consider a method that addresses the identified symptoms of depression and or anxiety. It was, therefore, hypothesised that:

- The clinician's view will provide a supportive ground to the original position of the study.
- The qualitatively gathered and analysed data will be compared with the quantitative study carried out previously.
- The theme extracted from the analysed data will provide a supportive explanation for the correlation between a clinician's perspective of their practice and an individual's view of their psychological wellbeing.

7.2 Method

7.2.1 Participants

12 participants of 3 male and nine female were recruited with mean age range of 40 years, from clinician's who work with symptoms of depression and anxiety. The participant's clinical work ranged from adolescents to adults who work independently. Recruited clinicians had core profession in psychiatry, Accredited Cognitive Behavioural Psychotherapists and clinical psychology.

7.2.2 Measures

Participants were interviewed using a schedule, which was shared with the participants prior to the interview. The schedule is attached as part of the documentation for approval. Questions considered as part of the interview schedule are given below:

7.2.2.1Thinking style/DAS-24

Thinking Style or Dysfunctional Attitude: Beck and colleagues have discussed the value and role of dysfunctional attitude in depression. One of the main findings explored included thinking style, which has features of need for approval, success and perfectionism with sub factors of achievement, dependency and self-control.

The main consideration relates to different attitudes or beliefs which people sometime hold. Examples of Dysfunctional attitude include; “If I fail partly, it is as bad as being a complete failure”, “What other people think about me is very important” and “I should always have complete control over my feelings”. **In your experience, what would closely relate to depressive presentation?**

7.2.2.2 Control or Mastery

Mastery or control: Pearlin and Schooler (1978) developed master/control measure. It will assess intent and ability to manage the perceived control of a person over their life and their drive towards psychological wellbeing. Examples of control include; “I have little control over the things that happen to me”, “I can do just about anything I really set my mind to” and “sometimes I feel that I’m being pushed around in life”.

In your experience, does control or mastery closely relate to depressive presentation? If so why?

7.2.2.3 Coping (CCS-15)

Cybernetic Coping Scale (CCS-15): People use a variety of different coping techniques to manage the many different situations in which they feel under stress. Edwards and Baglioni (1993) proposed the original version of the Cybernetic Coping Scale (CCS) based on the cybernetic theory of stress that was further modified by Guppy et al. (2004). CCS contains factors such as change the situation, accommodation, avoidance, symptom reduction and devaluation. Examples of coping statements include: “I try to change the situation to get what I want”; “I try to keep myself from thinking about the problem”; “I try to let off steam”; “I tell myself the problem wasn't so serious after all”; and “I try to avoid thinking about the problem”. **In your opinion, which of these factors is closely associated with depression?**

7.2.2.4 Thought awareness/Meta-Cognitive Awareness

Meta-cognitive awareness relates to the level of insight someone has in order to assess their own thoughts, which could be caused by internal or external variables. Examples include: “I trust my own way of seeing things when I feel depressed”; “When I am down, I can see things as they really are”; and “I can’t trust my judgments about myself when I feel down”. **In your experience, does meta-cognitive awareness have a direct impact on psychological wellbeing? If yes, how is this activated or maintained?**

7.2.2.5 Perception or attributional bias

Perception or attribution indicates the perceived view of given stimuli; this is closely linked with thinking style, yet it is regarded as a standalone process. The primary initial responses are strongly linked to attribution and perception of the individual. For the purpose of this study, the focus on attribution is on the negative aspects of perception linked to psychological wellbeing; in other words, depressive presentation. Examples include: “You meet a friend who acts hostilely towards you”; “You can’t get all the work done that others expect of you”; and “You give an important talk in front of group and the audience reacts negatively”. **In your experience how closely is attribution linked with symptoms of depression? What contributory factors trigger a negative stance towards this process?**

7.2.2.6 Additional question in elaborating the points made by the clinicians

When considering thinking style, perception, coping, meta-cognitive awareness and control, which one do you think contributes most to the psychological wellbeing of a depressed person?

Do you use any of these features when working with a depressed person or when consider their recovery towards psychological wellbeing?

7.3 Procedure

Following ethics approval from the Department of Psychology and the Ethics Committee, participants were invited to take part in this study. Consent and information about the study were disclosed to the participants prior to the interview. Consent to participate included the permission to be interviewed, write transcripts and record the session. Clinicians were interviewed individually using a schedule that had a clear format and outlined each question, which gave them the opportunity to reflect and consider their responses.

This was also helpful in assisting the procedure to minimise digression from the intended topic, thus reducing potential for distraction from the required objectives. Participants were interviewed for up to an hour and recorded information was reviewed in order to extract themes from the discussion.

The transfer of information took place in two phases, firstly by the researcher and then by a colleague. The recording of the interview and the schedule of the interview were reviewed separately to minimise any potential for contamination of information. This was intended to provide a secondary objective view of the gathered data as part of the triangulation method when taking a thematic approach.

Gathered information was sorted in terms of cases and reviewer's coded and gathered information. The categorised themes were classified and summarised into presented themes within a framework analysis format. The thematic design of the process is depicted in figure 7.1.

Thematic design: framework analysis

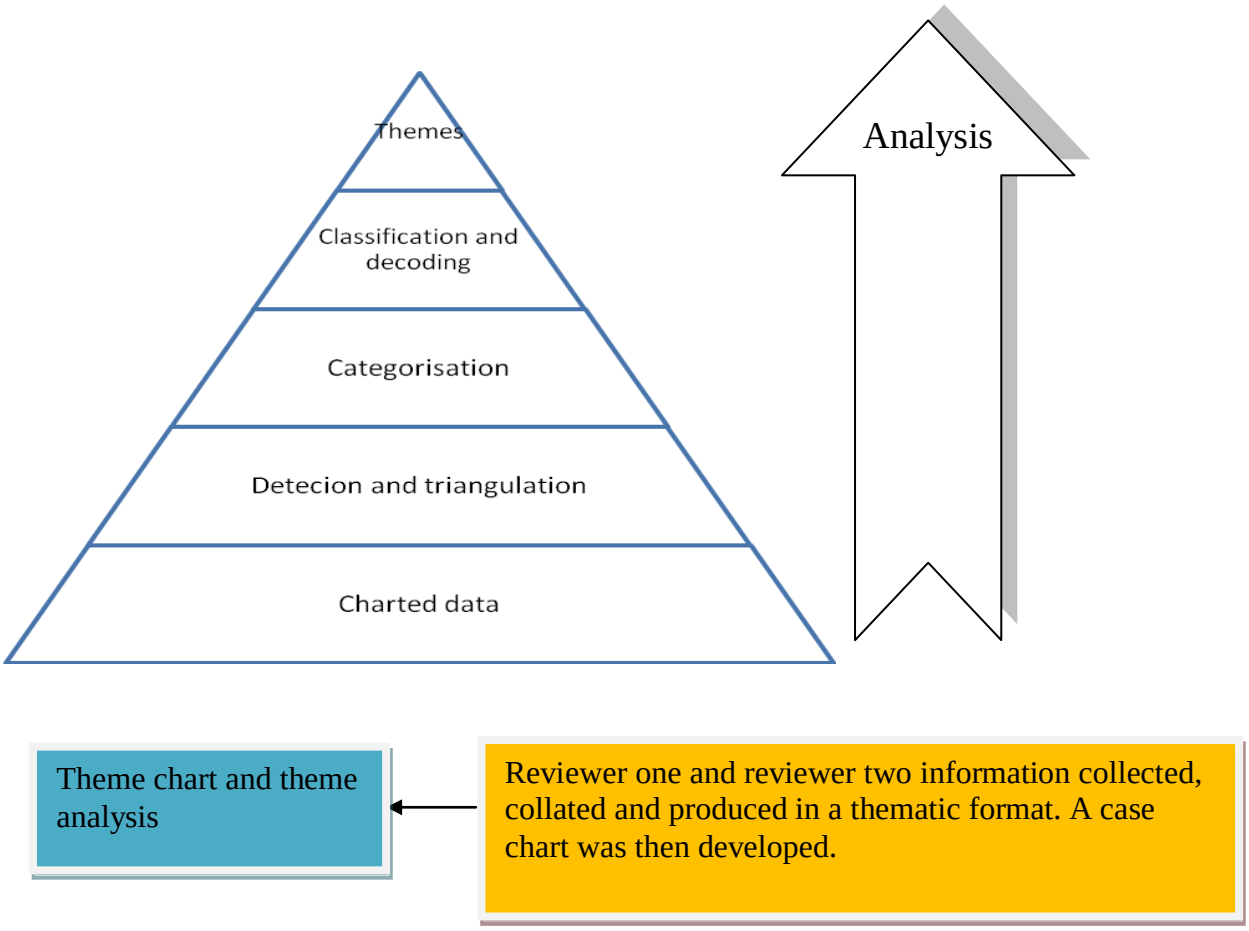


Figure 19 (7.1) Design adopted for the qualitative study and framework analysis

7.4 Data analysis

Data were collected and analysed using a thematic framework analysis supporting the evidence for the theoretical explanation (Galen et al., 2013). There were 12 sets of information offering a suitable account of the clinical perspective in relation to the use of cognitive measures and their relationship with symptoms of depression and/or anxiety. In general terms, using the interview scheduling allowed three main themes to be extracted, which offered grounding for analysis of the data. The theme expected to conclude an existence of correlations between cognitive measures utilised in earlier studies and their predictability of depression, anxiety and the subjective psychological wellbeing.

7.4.1 Participants' responses

Participants provided responses that have been evaluated by two reviewers, while the themes have been constructed in terms of the topics discussed based on the interview schedule and recording of the interview sessions. The first reviewer was a Cognitive Behavioural Psychotherapist with no prior involvement with the study; the second reviewer was the main researcher. The narratives were collected and processed separately following similar procedural processes in consideration of the triangulation method. In total there were six Cognitive Behavioural Therapists (CBTs), five Clinical Psychologists (Clinpsychs) and one Psychiatrist who participated in this qualitative study. The gathered data were produced in a systematic manner identifying narratives, shown in the tables below, which referred to case charts that were subject to a conceptualised coding method of framework analysis.

Case Charts

Table 49 (7.1) Participant 1

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	Clinpsych	Need for approval	Associated with thinking style, not significant alone	Close relationship with depression, can maintain the depression	Closely associated and has strong impact on psychological wellbeing	Interpretation and review of self, closely related to depression and mood in general	Thinking style and metacognitive awareness	Values and future expectations, being aware of current state of being	Metacognitive awareness has the strongest correlation
R2		DAS' need for approval is the main factor	Mastery and control are associated with thinking style and does not have the same impact alone on depression	Depression could be maintained by this factor and has a close relationship with depression	There are close and strong associations between metacognition and psychological wellbeing	This is important in that it helps interpretation and review of self, close relationship with depression and mood in general	Thinking style and metacognitive awareness, which are closely associated	Individual's value base and expectations and also being aware of their current state of being	Metacognitive awareness has the strongest correlation with depression

7.4.1.1 Summary of extracted theme one

First Participant's view suggested that the meta-cognition has the most direct correlation with symptoms of depression and anxiety. Although other contributors were reported to have an influential relationship the mere insight into one's cognitive processes appeared to be the main predictor of subjective psychological wellbeing.

Table 50 (7.2) Participant 2

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	Clinpsych	Achievement has closer relationship with depression, comparing self to others	Impacts are noted more then there are sense of learnt hopelessness	Coping avoidance and symptom reduction, as well as minimising the stimuli, are all contributory	Ability to step back and look at your thoughts, being able to question your thoughts	Closely linked with negative view of self and others around you	Metacognitive stands out and ability to observe and being tuned with thoughts	Metacognitive awareness and its fusion with thoughts	All relevant, thinking, perception, metacognition and control
R2		Achievement is a sub-factor of DAS, which has a closer relationship with depression, it also contributes towards comparing self to others	Sense of learnt helplessness is more notable, especially when less mastery is observed; therefore impacting more on individual	Contribution of sub-factors of coping notably relates to depressive presentation; namely, avoidance, symptom reduction and minimising the problem	Individual's ability to observe their thoughts by stepping back, noticing their thoughts and questioning their thoughts is a very important and relevant feature of depression	Perception is closely linked with negative thinking style and view of self in negative terms compared to others who are within the surroundings of an individual	Metacognition notably stands out as an individual becomes an "observer of their thoughts" and could be "tuned" in to their thoughts	Metacognition and its close relationship with thinking style	All the identified measures are relevant including thinking style, perception, metacognition and control

7.4.1.2 Summary of extracted theme two

The second participant described that all cognitive variables contribute to the subjective psychological wellbeing. However, the most significant contributors include the thinking style or dysfunctional attitude scale, individual's perception or attributional bias, insight into ones faced difficulty or meta-cognitive awareness were considered significant as well as the sense of control or mastery to make the required changes.

Table 51 (7.3) Participant 3

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	CBT	Achievement appears to have closest relationship with depression	Higher degree of control relates to a reduction in the sense of helplessness, especially when lacking motivation	Could be both positive and negative coping, also relates to considering change and finding ways to cope with feelings	Two statements in depression "Who I am" and "How I am", which are associated with thinking style and coping, activated by thinking style	Negative self attributes, taking responsibility and applying pressure on themselves	Thinking style and perception are mostly associated with depression	Thinking style, perception and mastery, also personality of individual such as a "smiling depressive person"	Thinking style, perception, personality, mastery and coping style all contribute
R2		Subscale of achievement has the closest relationship with depression	The greater the control would suggest "reduction in sense of hopelessness", this is more prominent when lack of motivation noted	Coping could be adopted both positively or negatively (for example "drinking in order to manage social anxiety"), this depends on an individual's personality to find coping skills in response to change and coping with their feelings	Metacognitive awareness is closely linked with thinking style and coping, which "is activated by thinking style", also awareness is related to two possible statements ("who I am" and "how I am") in relation to depression	Individuals are more likely to have a negative self-attribution and "this seems to stem from considering themselves responsible for behaviours or responses, which encourages a negative pressure on themselves"	The two mostly associated with depression are thinking style and perception	There is a number of factors that could be considered, including thinking style, perception, personality and control (mastery)	Thinking style, perception, personality, coping style and control or mastery

7.4.1.3 Summary of extracted theme three

Participant three indicated that although there are a number of contributing factors involved, thinking style and attribution of an individual play a great part, followed by individual's personality trait, ability to control and ones' coping style are significantly related to recovery and maintenance of subjective psychological wellbeing.

Table 52 (7.4) Participant 4

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	CBT	Need for approval is closely linked with depression	Lack of control at first glance feels related to self-deficit sensation and is more likely to be linked with anxiety and worry, also features of depression	This is more likely to be associated with changing situations and avoidance, "no clinical depression without a sense of hopelessness and feeling powerless to get out of that"	Have a direct impact, "helps to identify where our mind is at", being aware of automatic thoughts and activation or maintenance of thoughts of feelings, link between metacognition and activation of information	Very closely linked with symptoms of depression, attribution of meaning, evaluating approval or disapproval, "impacting on aetiology of depression"	Having no control, they feel hopeless, no choice to make and reside in depression	The cause and effect, changing one will shift all of them but most importantly is control	Control, perception and awareness
R2		The idea that you are never good enough and comparing this to others suggests the need for approval to be closely associated with the idea of self-judgement and depression	Examples of failure and expectation and idea of constant failure, self-defeating while a sense of hopelessness feels less about control, pervasive hopelessness is more anxiety-led and worry, features of depression	Coping can only relate to the depression when an individual feels a sense of helplessness, while changing situations or avoidance could be a part of the maintenance cycle of depressive presentation, although "no clinical depression could be noted without any sense of hopelessness"	Metacognition has a direct "impact on identifying where our mind is at", it relates to judgement and making decisions on accuracy of perception, "considering cognition at a deeper level and being aware would help in dealing with change", activation of information could be understood by metacognitive awareness	"Attribution is closely linked with symptoms of depression", This helps with evaluation of meaning, interpretation and approval or disapproval, which is hard-wired to seek approval, impacting on aetiology of depression with pervasive sense of hopelessness	One thing and that is control, having no control means "no choice to make and giving up all hope", having control to effect change and therefore having choice	Having considered all the features discussed, making an individual aware of the problem and changing one will affect all the other issues, but "first is control"	Control, perception and metacognitive awareness of choice and changes

7.4.1.4 Summary of extracted theme four

The fourth participant considered control as the primary contributor whilst reporting attribution of individual plays a part in direction of recovery and management of wellbeing. Although, it was suggested that awareness of wellbeing also has a significant role to play in helping individuals to consider change.

Table 53 (7.5) Participant 5

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	CBT	DAS not having a deep relationship with depressive presentation, locus of control seems to interplay a lot more, cognitive style and perceptual style are related to drivers of rumination	If thinking as a depressed person, seeing this as a failure of being hopeful, having control improves self-esteem and implies you have a choice	Coping is a mediator of rumination and worry, which is important in maintaining a depressive state, the factor mostly influencing here is changing the situation.	"It is an essential component of getting over psychological disorder, not having any cognition you can't see if improving or not"	There is an association between bias and depression, "when coming out of depression it is important to pay attention, as it is helpful in coming out of depression stronger"	Control is the primary mode of change	Role of control in anxiety and depression as a follow up and sense of hopelessness	Control
R2		Thinking style is not associated at deeper level with depressive presentation, "although they are linked with drivers of rumination that seems to be one key thing related to depression", locus of control play a greater role	A depressed person sees the lack of control as a failure in having any choice and getting a sense of being trapped and hopelessness, "self-esteem is also affected as a secondary thing"	"Coping is a vital mediator or rumination and worry" and "is important in maintaining a depressive state", this is based on external problems while change in situation is linked with change in perception and mood improvement	"Metacognitive awareness is an essential component of getting over a psychological disorder", this would enable an individual to note change which gives special access to depression, thus "self-privileged window to see true self"	"Attribution is more of cause and effect", "there is an association between bias and depression", it is also related to more depressive episodes and chronic depression and, by paying attention, which is essential and helpful in changing sense of being, "hemmed in and the world closing on you"	Control is the primary marker of change	Control plays a direct role in anxiety as a primary issue leading to depression and sense of hopelessness	Control

7.4.1.5 Summary of extracted theme five

The fifth participant singled out control as the main contributor towards both depressive presentation and anxiety and added the lack of control could only lead to one or the other outcome where individual's state of subjective wellbeing is questioned and threatened. In turn this will lead to a distressing presentation and therefore lack of wellbeing. Other commentary included anxiety as a primary concern leading to a state of helplessness and depression that befitted with learned helplessness theory.

Table 54 (7.6) Participant 6

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	CBT	Achievement is closely related to depressive presentation	Not having control over your own life or events can cause depression and sense of hopelessness	There are different modes of coping, but most likely factor is avoidance, which does have a correlation with depression	Lack of metacognitive awareness would indicate a prolonged period of depression, in case of depression negatives would be attended and remembered	Attribution is closely linked with depression and negative view of self confirms the thought of worthlessness, which could relate to early experiences and high criticism	Thinking style and perception are closely linked with psychological wellbeing	Thinking style and perception	Thinking style and perception of individual, triggering sense of hopelessness and lack of control and coping, as well as metacognitive awareness
R2		In sub-factors of DAS, achievement is closely related to depressive presentation	Control is related to depression, lower self-efficacy and perceiving whether one has control, or in case of not having control over events or own life could lead to depression, also implies with sense of hopelessness	Coping would highlight how an individual copes with changes in situations or accommodates events, but the most prominent factor is avoidance which is linked with depressive presentation	Pre-existing view of self and world and lack of metacognitive awareness would indicate a prolonged state of depression, which becomes a self-fulfilling prophecy, and attention to negatives, as well as negative memories	Attribution has a close link with depression where an individual tends to attribute towards negative events, self-view and confirmation in sense of worthlessness, based on early experiences and high criticism or lack of praise and warmth	The most influential factors are thinking style and perception relating to psychological wellbeing.	Thinking style and perception	There are number of contributors, thinking style and perception where sense of hopelessness could be initiated, the lack of purpose, control and suitable coping; lack of metacognitive awareness would also contribute towards sense of hopelessness

7.4.1.6 Summary of extracted theme six

The sixth participant's responses related to initial states of thinking style and individual's perception that triggers sense of helplessness. This then will lead to insight into the lack of control and inability to cope. This idea is reviewed and confirms the lack of control or coping within the meta-cognitive domain is linked with ruminative thinking style. The perpetuating process is reappraised by the same factors, initiating a self-critical process and leading to a depressive or anxiety based difficulty.

Table 55 (7.7) Participant 7

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	Psychiatrist	The cognitive patterns are not important, but the emotional or feeling drivers, considering feeling as primary state of mind, and lack of success would be the one mostly contributes towards depression	Lack of control is related to anxiety and could lead to depression, also nothing you do makes a difference, hopelessness model	Effective coping strategies are symptom reduction, such as "going out and doing things", devaluation is a learnt convenience and avoidance can have negative effect on symptom reduction	"Higher degree of self-awareness can lead to negative view of self and personal struggle", emotion fits around them and insight into your thought process is highly subjective, also previous experiences or stories can activate the awareness, leading to negative state of being	Attribution is closely linked to symptoms of depression, "a fundamental phenomenon" "seeing everything through a negative lens or glasses", unsure about core feature of depression, still mood is a primal component	Mood is the main feature and attribution is a the main contributor to depression	All contribute, but metacognitive has less importance and most contributors are attribution and coping	Emotional drive, control, attribution, coping
R2		Depression is not necessarily associated with cognitive pattern, looking at the feelings and drivers of emotion, "cognitive issues are rationalisation of feelings, although success of lack of it relates to depression"	Lack of control usually associated with anxiety that can lead to depression, "hopelessness model", no difference could be achieved where there is a lack of energy, motivation or physiological depression	Coping strategies could have both negative or positive effects, this includes accommodation, acceptance of certain situations or reducing symptoms by undertaking activities, also devaluation is a learnt convenience, and avoidance can be negative in symptom reduction, such as drinking	"Metacognitive awareness could be a negative thing, especially where higher levels of awareness could lead to negative view of self, as emotional states fits within the process of insight into your thoughts, although insight is highly subjective, reflecting on thoughts and activating negative thought patterns, which could be based on past experiences or stories"	Attribution is very closely linked with depression and it is a "fundamental phenomenon", as though someone is looking through everything with a negative lens or glasses, although the primal component remains on mood	"Mood is like music in a film", it dictates and diverts the process, but attribution is the main contributor in getting a negative drive	Considering all aspects influential, but metacognitive awareness is less important while coping and attribution are more relevant	Emotional responses, attribution., coping, control

7.4.1.7 Summary of extracted theme seven

The seventh participant reported that the primary responses are emotionally based and commenting on other variables and contributors such as attributional bias, individual's coping ability and control. In spite of other contributors the main primal response is emotionally based.

Table 56 (7.8) Participant 8

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	CBT	There is not any one factor, this is linked to mental health state, general thinking style as individually conceptualised	Generic mental health factor, it is not specific to control	Coping relates more to anxiety, but in terms of depression it seems to be more related to avoidance and sense of hopelessness	Engaging metacognitively with minor depressive presentation could be effective, unable to access when chronically depressed, mood is the activator and strong feeling of hopelessness	Attribution is very heavily weighted towards depression, information is confused and negatively based	"Often anxious people are depressed, and depressed people are anxious", attribution and metacognitive awareness	All of these features with exception of coping	Attribution, metacognitive awareness, thinking style
R2		Don't think that there is any one factor that has priority in causing depression, as it is individually conceptualised and relates across the board to past or current mental orientation	The generic state of mental health does not particularly relate to control and depression	Coping in general appears closer to anxiety presentation, although avoidance relates to depression, it is the sense of hopelessness that impacts on seeking strategies to cope	Moderate to severe depressed clients are unable to actively engage with metacognitive awareness, effective in management of minor depressive presentation, chronic state requires change, mood is the activator, which leads to lack of clarity in thinking, sense of hopelessness	Attribution is very strongly implicated and weighted towards a depressive view, mood drops to a certain point and then changes to depressive mind set "perceiving things all the time negatively"	Two main features are attribution and metacognitive awareness, "often anxious people are depressed and vice versa"	Other than coping, all the others are used	Thinking style, attribution and metacognitive awareness

7.4.1.8 Summary of extracted theme eight

Participant eight's response highlighted meta-cognition and attribution as features associated with depressive and anxiety based problems, suggesting that often people experience both of these symptoms. Adding, the primary contributors of subjective wellbeing including thinking style, attribution and meta-cognitive awareness.

Table 57 (7.9) Participant 9

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	Clinpsych	There are three main sub-factors contributing to wards' depressive presentation, need for approval, perfectionism, having control over feelings and hopelessness about future achievements	Often relates to trigger factors, these are closely linked with precipitating and maintaining factors of depression	Considering symptom reduction is linked with self-care and self-worth, while avoidance and accommodation are closely associated with coping and depression.	Yes, it definitely is linked with depression, interacting with external and physical wellbeing, it could become a ruminative style modelling and detaching from childhood, developing negative style.	Linked with depression and linked with symptoms of depression, but not necessarily to depression, deeper level of cognitive bias can instigate longstanding way of seeing everything negatively	The least contributors are perception and coping, but most contributors are metacognitive awareness and thinking style	Yes, all these features are utilised in clinical work	Thinking style and metacognition, also memory recall
R2		The one that is closely includes having control over feeling, needing to be in control, whereas for depression it is the need for approval, perfectionism, especially in middle class people, also achievement and hopelessness about future intrinsic worth	Control does have a direct link with depression, often relates to trigger factors that influence precipitation or maintenance of depression, also considering what mode of feeling is adopted, such as helplessness	Coping is associated with depression, as part of protecting against symptom reduction, which is also linked with self-care and self-worth, socialising or avoiding situations, although avoidance and accommodation are closely linked, and trying to change the situation	Metacognitive awareness is definitely linked with depression and it could be developed and modelled from childhood, this could lead to social isolation and a ruminative style of thinking	Attribution is linked with transit mood, also linked with symptoms, but not necessarily depression and, at a deeper level of cognition, could lead to a longstanding negative biases	The least contributors towards depression are attribution and coping, but in contrast metacognitive awareness and thinking style contribute the most, "they are the gateway to coping"	All features are utilised in practice	Thinking style, metacognitive awareness, otherwise memory recall plays part in negative style of thinking

7.4.1.9 Summary of extracted theme nine

The ninth participant considered all reported variables do contribute at some level, indicating that the least contributors of depression are attribution and coping and in contrast the meta-cognitive awareness and thinking style are closely associated and act as the gateway to coping. The memory recall does play a great role in adapting a negative thinking style or meta-cognitive awareness that is negative, leading to a poor state of psychological wellbeing.

Table 58 (7.10) Participant 10

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	CBT	People can have a rigid thinking style and resist change, which becomes dysfunctional	Feeling that you haven't got control, feeling hopeless and leading to depression, saying "I am not coping"	Not familiar with the measure but, dependent on acute stress, individual may not be able to cope with chronic stress demands, sense of hopelessness and depression	People more aware of this are at less risk of relapse and managing their symptoms, insight makes people less vulnerable and contributes to psychological wellbeing	This could trigger thinking style, the negative way of perceiving and reinforcing negative thoughts	Thinking style and metacognitive awareness	Perception, thinking style and awareness, also considering cultural and neurological problems	Attribution, thinking style, metacognitive awareness
R2		Thinking style of people could be extreme or rigid and lead to dysfunctional style of thinking , and in turn depressive presentation	People who feel they don't have any control over their lives tend to feel hopeless, leading to depressive presentation	Coping is dependent on the level of stress, whether acute or chronic stress, or may not anticipate the demand, feeling hopeless and leading to depressive presentation	Offers ability to recognise and manage symptoms and reduce risk of relapse, making the person less vulnerable and more insightful about their psychological wellbeing	Noting events in a different way, while their observation could initiate the thinking style, the thinking could be perceived in a negative way	Thinking style and metacognitive awareness	Using thinking style, metacognitive awareness and perception, also cultural perception and neurological problems, biological influences	Thinking style, attribution and metacognition

7.4.1.10 Summary of extracted theme ten

The tenth participant also reported that thinking style, meta-cognitive awareness and individual's attributional bias do play a great role in processing, understanding and appraisal of the experience, where they may adapt a hopeless style feeling that they do not have any control over their lives, leading to a depressive presentation. Other contributors in processing could consider cultural perceptions or neurological difficulties that could impact on an individual's state of subjective psychological wellbeing.

Table 59 (7.11) Participant 11

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	Clinpsych	There is relevance of social acceptance and, when people are depressed, thinking style remains negative, need for approval and acceptance of other	"People who are depressed feeling hopeless and lack of control to change anything, sense of giving up" and lack goals	"People get distressed and avoid, leading to depression dependent on an individual's coping style, but everybody does avoidance"	"Yes it definitely relates to depression, unless they have recovered from depression, becoming aware of your thoughts and evaluating your thoughts, maybe linked to intelligence"	Depressed people more likely to attribute negatively, dependent on upbringing and environment or past memories, childhood or trauma also education.	They all contribute, but mostly control and metacognitive awareness stand out	Metacognition, shared features noted in depression and anxiety, working with self-criticism and behaviour	Metacognition and control
R2		It works differently for people dependent on social acceptance and can lead to more negatively-based thinking, so need for approval and socially acceptance by others	"Yes it does have a link with depression, when people have no control, feeling hopeless and lacking control to make changes and stop doing things", having sense of giving up "no matter what"	"When people get more stressed they tend to avoid which is closely related to depression as a cycle of avoidance starts and its downwards to depression, everybody uses avoidance but it is dependent on their coping style"	Metacognition definitely relates to depression, people think about their thoughts in variety of ways, psychoeducation, discussion, mindfulness and evaluation of their thoughts, but more aware people are using intelligence to critically evaluate their thoughts	Depressed people attribute more negatively as a prominent feature in their psyche, internal rates we have about our self and world, our upbringing, environment, education and childhood memories contribute to negative cycle of attribution	All features contribute but mastery or control and metacognitive awareness stand out	There are similar features in anxiety and depression that use metacognition and working with self-criticism	Metacognition and control

7.4.1.11 Summary of extracted theme eleven

The eleventh participant's response considered lack of control as a contributor to hopelessness, where avoiding acts as a method of coping leads to depressive presentation. The main contributors in relation to psychological wellbeing are mastery and meta-cognitive awareness. Having insight into the experience allows the individual to gain control and having control enables the person to manage distress.

Table 60 (7.12) Participant 12

	Profession	DAS	Mastery	Coping	Metacognition	Attribution	Most influential feature	Most utilised feature	Extracted theme
R1	Clinpsych	"There are a lot of features, but social value and perfectionism relate to self-blame, self-worth and negative evaluation of thinking style"	"Control is less directly involved compared to thinking style, learnt helplessness and losing control, which lead to anxiety or depression, more to anxiety"	"Avoidance is the one mostly related to depression, little control over situation, too difficult to control and leads to avoidance"	This is linked with control and thinking style, also negative automatic thoughts, where thoughts pop in your head and you decide to avoid or accept and deal with the emotion such as depression	This is linked with thinking style and self-worth and self-blame, attribution towards anxiety, but the grounding is in core value and making an evaluation of the situation	Thinking style and attribution biases, developed form core belief	Using thinking style and attribution, initial grounding in metacognitive awareness, coping style and behavioural, also consider control	Thinking style, attribution, metacognitive awareness and coping
R2		There is a number of features contributing to depression, negative evaluation and negative thinking style, which mostly relate to social evaluation, while self-blame and self-worth relate to perfectionism	Thinking style is closer to depression than control, loss of control can lead to learnt helplessness and anxiety and depression, "not seeing a way out", links more closely with anxiety	Coping style relates to avoidance or changing the situation and, when this is not possible, the lack of control or difficulties in changing the situation leads to avoidance or depression, with "avoidance the one mostly related to depression"	"Yes it has a direct link with depression, positive impact on wellbeing, relating to control, negative thinking style and automatic thought processes, less control equals less metacognitive awareness"	"Attribution is linked with negative style of thinking about self and relates to blame and self-worth, attributing mostly to anxiety, but its grounding is in core belief that we use to evaluate the situation"	Thinking style and attributional bias are similar in the sense of symptoms and are both developed in core belief	Initially consider thinking style and attribution bias, metacognitive awareness, coping style/ behavioural approach, also in some cases control, but emotional resilience is the main contributor	Thinking style, attributional bias, metacognitive awareness and coping

7.4.1.12 Summary of extracted theme twelve

The final participant considered control less contributory than thinking style, also reporting avoidance as a coping method directly related to lack or productivity in management of depression or anxiety. Overall, thinking style, attributional biases, meta-cognitive awareness and coping do play a significant role in depression, anxiety and subjective psychological wellbeing.

The responses from the participants were triangulated and themed, which produced the summary shown in the chart below;

Table 61 (7.13) Extracted themes for all twelve participants

	Most influential features considered by participants	**Most utilised feature by participants**	**Main extracted theme**
Theme 1	7x considered thinking style	4x considered all features	9x considered metacognitive awareness
Theme 2	5x considered metacognitive awareness	3x considered thinking style	3x considered control
Theme 3	2x considered control	2x considered control	Additional themes included memory, emotional drive and personality
Theme 4	2x considered attribution style	2x considered metacognitive awareness and 1x considered value	Thinking, coping and perception were mentioned by most clinicians, but as the main contributors

The extracted themes indicate that the majority of the current modes of intervention are based around metacognitive awareness, which is consistent with the current third wave evidence-based approaches such as MBCT, ACT and CFT as well as CBT. As previously highlighted, however, the lack of success in the treatment of depression and depressive relapse remains a concern to individuals, organisations and society at large.

In spite of the acknowledgement of shortfalls, the method of approach towards depression and psychological wellbeing generally remains a unilateral one. Although the majority of professionals have attempted to address this situation by considering a multifaceted approach, the overarching challenge remains.

There are a number of possible conclusions that could be drawn from the gathered data; most of all, however, the mode of assessment may need to be shifted if current interventions fall short in matching an individual's needs. Similar outcomes have been reported in other studies such as (Beutler, Someah, Kimpara and Miller, 2016). Furthermore, the results could support the need to identify a more suitable mode of understanding and interpreting psychological wellbeing. This aspect is identified within the study as a main feature behind addressing the aforementioned shortfalls. Other notable observation included the participant's professional training, interests in therapeutic style and their modality or approaches that derived their responses.

Hypothesise were tested in previous chapters indicated that there are clear correlations between detection of psychological wellbeing and specific measures of appraisals, control or mastery, attributional style and namely personality traits of individuals. The main rationale included consideration of these factors and their application in clinical practice. The lack of direct access to client group offered restrictions in providing suitable support of the hypotheses. However, following a period of review of previous mixed method studies a conclusion was drawn in use of clinician's views. This consideration allowed possibility of addressing the potential for the shortfall in this study. The overview section of this chapter provided the rationale for inclusion of qualitative study of this nature that was modelled in line with previous studies (Braun and Clarke, 2006; Howarth et al., 2014; Spendelow, 2015; Railton and Mowat, 2000; Isaac et al., 2010). This study considered similar stance in support of the hypotheses set out in chapter one and in this chapter where the psychological wellbeing amongst general population when specific cognitive measures are used to predict the psychological wellbeing.

It is noteworthy to report that one participant in this study indicated the personality trait and the remaining participant's responses were focused on cognitive style, attribution and Metacognitive awareness and finally control. Interestingly, this was a contrast to previous data from quantitative study were personality trait showed the strongest correlation followed by control.

7.5 Chapter summary: Framework Analysis - Clinicians' Views of Cognitive Measures used in Depression and Anxiety

This chapter provided an overview of rationale for considering a qualitative methodology as part of the mixed method research. It was postulated that the correlation between the identified cognitive measures would be observable in clinical population. Unfortunately due to lack of access to clinical population, a modified view considered that followed previous studies that could address this shortfall.

In this study, (n=12) participants were recruited from clinicians who are currently working across different fields of Psychology and Psychiatry. Participant's views were explored on the use of cognitive measures and their application in practice by interviewing clinicians and extracted their views on symptoms of depression and anxiety. The gathered information from the participants was collated and themed for analysis.

The data was analysed independently by researcher and one other where the extracted themes were compared and reported, producing a suitable thematic data. Data was analysed using framework analysis where the themed information provided the supporting evidence to previously hypotheses in quantitative study.

Interestingly, a number of commonalities were noted between the previous study and current sets of data, namely the cognitive components that are being targeted and worked, measures and their role in general. The extracted themes included thinking style, attribution and control, as well as personality traits. In contrast to clinical report the strongest correlation was noted in quantitative data analysis was personality trait followed by control for symptoms of depression and anxiety.

There are possible explanations with reference to choice or style of intervention that does not match with the findings from this study. This could be explained by clinician's own attribution, thinking style, coping and control characteristics as well as their personality traits.

Furthermore, the impact on the selected approach could be based on the clinician's training modality that could dictate the method of intervention. In spite the distinction and difference between the outcomes, thematic and quantitative analysis did produce similarities that support of the hypotheses.

The notable distinction included the strong association between the personality traits and subjective psychological wellbeing in quantitative study that was minimally reported by the clinicians in this study.

Chapter Eight: Discussion

8.1 Overview of the thesis and its outcome

This study investigated the utility of cognitive measures as predictors of psychological wellbeing. In order to affirm the hypotheses a systematic review of theories and their implications was conducted and subsequently sets of measures were selected. The selected measures characteristics and their efficacy were examined in order to confirm their utility and suitability for this project.

In this chapter an overview of results and findings are presented in order to offer a cohesive description of the findings. In order to achieve this outcome, chapter has been divided into four segments that include;

a) Review of research and theoretical rationale
b) Research framework and confirmation of hypotheses and discussion in relation to previous research
c) Contribution to knowledge
d) Concluding remarks, limitations and future directions

8.2 Review of research framework

A plethora of literature has investigated the relationship between cognitive reactivity, dysfunctional attitudes and depressive relapse. One particular study, Jarrett et al, (2012) argued that depression affects 13-16% of the population worldwide and is considered as one of the frontrunners of disability worldwide. Jarrett et al, (2012) also added that there is no specific remedy for depression, although it has been recognised that the current evidence based treatment available such as Cognitive Therapy (CT) could reduce symptoms and risk of relapse in depression.

Furthermore, other researchers have identified components that contribute towards depression and maintenance of depressive symptoms. For example, one of the most discussed issues in Cognitive Therapy (CT) consist of the attribute in the content of dysfunctional thinking (Beevers et al, 2003; Segal et al 2002) that also correlates with an increase in severity of depression and risk of relapse (Teasdale et al., 2002). Moreover, studies surrounding the assessment of dysfunctional attitude and its content (De Graaf et al., 2009; Power et al, 1994) have highlighted the importance of DAS sub factors and their role in development and maintenance of depression or anxiety.

Similarly, a number of studies have considered other factors as contributors of psychological distress. The association of factors such as cognitive components and personality characteristics or traits, locus of control, neuroticism, attentional bias as well as meta-cognitive awareness have all shown to display an active correlation with stress, anxiety and depression (Abramson et al, 1978, Beck et al, 1979; Costa and McCrae, 1989; Guppy and Weatherstone, 1997; Hewitt and Flett, 2004; Rafferty and Griffin, 2006; Segal, Gemar and Williams, 1999; Teasdale et al, 2002). Moreover, a study by Clark et al., (1994) argued that an increase in level of stress is associated with an elevated negative emotional response. Adding stress is associated with a specific personality trait and therefore indicating a unique emotional signature. Nonetheless, a number of possible discrimination could be drawn from these explanations for associations or affiliations between cognitive components and their emotional cues. The previous studies and their finding have contributed towards the initial rationale for this investigation in order to examine the role and affiliation of cognitive features with depression.

In order to establish a clearer understanding of the correlations between these variables a series of assessments and analysis deemed essential. Therefore this study considered a rigorous systematic review of literature based on 726 studies leading to selection of the most suitable measures. The selection was based on the measures features and utility in offering a predictive quality that could indicate the subjective psychological wellbeing. The first step in this investigation included the review of measures, their validity and reliability. The next step included the design and development of a methodological framework.

The literature review and examination of previous studies enhanced the focus in development of the proposal and the hypotheses. This led to advancement and commencement of the pilot study, and therefore examining the utility and validity of the selected measures as well as seeking confirmation of hypotheses in an exploratory investigation.

The current investigation adopted and considered studies by Beck and his colleagues (1979) who identified DAS as a predictor for BDI-II scores and therefore a predictor of depressive presentation. The correlations between these variables were tested in the pilot study that is being discussed in following sections. The method of measuring the experienced symptom was developed and presented in Beck's Depression Inventory that has shown to have evidence in support of the correlation between dysfunctional thinking style and depression. The relationship between DAS and depression was forwarded by Beck's (1987) theory of diathesis-stress and Dysfunctional Attitude. Moreover, in recent publications similar studies have replicated Beck's findings (De Graaf et al., 2009; Moore et al., 2014; and Senormanci et al., 2013). Furthermore, DAS has shown in pre-post treatment to have a positive association with mental health and outcome measures of general well being (Zuroff et al., 1999) where the relationships between low mood, self-esteem and degrees of vulnerability were examined. There is also no surprise that DAS has been reported as an important variable in the assessment of vulnerability and depression within an inpatient population (Dunkley, Sainslow, Grilo and McGlashan, 2004; Shahar et al, 2003; Blatt et al, 1995).

Although, in contrast Oei and Dingle (2001) argued that DAS is poorly related to mood at any time when an individual is depressed and further explained that DAS is lacking reliability within the depressed population. Oei and Dingle (2001) referred to the distinction between individuals who have already experienced depression compared to the non-clinical population.

Interestingly, the debate amongst authors with regards to DAS and its relationship with depression has highlighted other areas of debate and research. For example Teasdale (2001) suggested that specific sub-scales of DAS have higher predictive validity. Similar finding was also noted in studies such as Senormanci et al., (2013) and Moore et al., (2014) reporting that the Success-perfectionism sub-scale of DAS was more relevant in the prediction of depression scores than Dependency sub scale. Nonetheless, DAS remains an efficient and reliable measure that has shown to predict the depressogenic presentation. This study considered and adapted the use of DAS, although a shortened version of DAS with 24 items for its utility and reliability. A shortened version of DAS (24 items) was initially reported by Power et al (1994) have shown to have similar reliability and consistency as the original version with similar results to previous studies. This study considered conducting examination on the link between DAS and Depression amongst the general population where the findings could be compared with previous studies.

In addition to DAS-24 and BDI other measures were utilised including attribution (ASQ), Mastery, Meta-Cognitive awareness, Neuroticism and Coping. The utility and some brief account of current debate are presented next starting with ASQ. Studies have shown that the link between ASQ and BDI was non-significant (Ilardi and Craighead, 1999) failing to find any correlation between positive or negative scores of the ASQ and BDI. The impact and relevance of ASQ as a measure in prediction of BDI is contested during the next phase where the current study has found strong correlation with BDI. The findings from the current study were similar to previous studies (Abramson et al., 1978; Peterson et al., 1982) who have found strong correlations between depression and ASQ. One of such explanation included the cognitive scarring effect that could cause depressive attributional style (Nolen-Hoeksema, Girgus and Seligman, 1992). Although, the details of this effect were beyond the remit of this study, however some parallel scores were noted that could provide an assumption in support of scaring effect. In addition, Nolen-Hoeksema, Girgus and Seligman, (1992) reported this might account for the possible depressogenic cognitive style. Furthermore, a study by Hewitt et al., (2004) also suggested a strong correlation between ASQ's negative and BDI scores.

Similarly, the link between mastery and depression has been evidenced in several studies (Alloy and Abramson, 1979; Burger, 1984; Emmelkamp and Cohen-Kettenis, 1975; Gadalla, 2009; Lwinsohn, Mischel, Chaplin and Barton, 1980; Rotter, 1966), who also reported a strong correlation between mastery, depression and phobic anxiety. A number of studies on Meta-Cognitive Awareness (MAQ) have shown a strong correlation between depression and anxiety scores with MAQ (Ingram et al., 1986; Teasdale et al., 2002; Wells, 2008). A recent publication by Yilmaz, Gencoz and Wells (2015) argued that when MAQ is compared to DAS, MAQ is more closely associated with depression.

Although no other studies have considered and discovered these findings, a study by Teasdale et al (2002) suggested that mechanisms in Meta awareness are different, adding the cognitive processes are functioning at a higher order, thus meta-awareness is considered to be embedded within this process. This may suggest that there are different aspects of cognitive processes that contribute equally to awareness and depression.

Similarly, a number of studies on coping have produced a strong body of evidence for coping and its relationship with stress, depression and psychological wellbeing (Edwards and Baglioni, 1993; Guppy and Weatherstone, 1997; Guppy et al, 2004; Park and Adler, 2003). One such study was Elkin et al., (2006) who found strong evidence for coping in a clinical population, arguing for a correlation and prediction between coping, psychological wellbeing and recovery from depression.

Systematic review of literature on 726 articles was conducted when dysfunctional attitude, DAS and psychological well-being were computed in the search engine, producing 15 articles across decades of research spanning from the 1960's up to date. A further systematic review of the literature performed on the 15 published papers that singled out DAS as a predictor of depression (De Graaf et al., 2009; Moore et al., 2014; Power et al, 1994; and Senormanci et al., 2013).

The methodological approach considered was similar to previous studies (De Graaf et al., 2009; Guppy and Weatherstone, 1997; Guppy et al., 2004; Parkes et al., 1994; Segal et al., 2002; Senormanci et al., 2013). In order to provide a suitable research method, a correlation coefficient, multiple regression, and confirmatory factor analysis was performed, in order to examine the relationship between the variables, whilst testing their internal consistencies against cognition and its sub system processes.

The current research was developed following a methodological design shown in fig.2.1. In addition a power calculation was conducted in line with progression of the proposal. The utility of cognitive measures considered as variables that could predict the subjective psychological wellbeing. This investigation was initiated with the pilot study. Further analysis and amendments were adopted as the research developed further.

Additional data analysis was performed where the measures were administered in time one and time two. This method was adopted to examine the integrity of the hypotheses with the selected measures across time. Unfortunately further amendments were considered due to the limitation of data at time two. Further issues of concern included the fragmented data as well as risk of contamination to gathered data. The risk could be explained by the filtering effect where the information could be distorted due to the nature of the self-reported measures.
The latter concern was highlighted in a meta-analysis study of cognitive specificity and emotional responses of depression and anxiety, where 13 studies indicated a range of deficiencies in research quality (Beck and Perkins, 2001) suggesting a distorted outcome due to use of self-reported measures. In response to the possible shortfalls an additional thematic study was developed and conducted. The final chapter of the study utilised a qualitative research methodology (Braun and Clarke, 2006) adopting a thematic framework analysis in evidence for the previously tested quantitative research.

It was anticipated that non-clinical participant's view as well as the clinician's who are working with psychologically distress population would provide a more comprehensive explanation of this study's position and theoretical explanation. Previous studies have considered and utilised qualitatively based rationale (Howarth et al., 2014; Spendelow, 2015; Railton and Mowat, 2000; Isaac et al., 2010), which were similar in terms to of process to the current study. These qualitative studies examined the view of clinicians, such as counsellors and general practitioners, in relation to depression, service provision and mode of intervention. In a mixed method research, Kaviani and Hamedi, (2011) combined quantitative and qualitative data analysis in examining the correlations between negative themes of metaphors and their association with depression. The current research adopted a similar mixed methodological approach that consists of both modes of analyses.

This study considered the qualitative methodology by obtaining clinician's views about the measures, their utility and importance of them in clinical settings. The procedure and outcome of this investigation is represented in chapter seven. The findings from this section of study were strikingly in support of the association and role of the identified variables and symptoms of depression and anxiety as well as the psychological wellbeing. The next stage of this chapter will provide an overview of framework analysis that includes the pilot study, the findings and comparisons to previous studies, conclusions and contributions from the findings as well as future research directions.

8.3 Research framework and confirmation of hypotheses

8.3.1 Pilot study

In this chapter the research framework was designed (fig 2.1) and executed in order to test the hypotheses. The aim of the pilot study was to explore the predictive quality of the selected measures, their affiliation and correlation with depression (BDI-II). The measures were selected following an extended literature review, considering their suitability as well as their utility for this study. This phase of the study considered six measures that included DAS-24, Mastery, ASQ (6-negative items), MAQ, CCS-15 and BDI-II. Following a power calculation and estimation of the required participants a set of methodological procedure was adopted. During the data analysis, examination of data variables including correlation, multiple regressions and confirmatory factor analysis that included path analysis on measures was conducted. In addition, test of covariance and correlations coefficient amongst the variables were examined, this was achieved with utility of the SPSS 19 and AMOS 20 software.

Initial wave of study managed to recruit participants (n=147) from the psychology department of University of Bedfordshire where data was manually collected and computed for analysis. A total of (n=127) data sets were complete and therefore it was utilised for the analysis. The demographic characteristics of the participants reported here included the female (n=99) with 77.5% and male (n=28) respondents that made up the remaining 22.5% with overall average age of 44 years of age. The ethnic makeup of the participants ranged from Caucasian=83; Black=28 and Other Minorities=16. The reported responses differed between male and female respondents with female indicating higher indices of anxiety and depression, interestingly; this finding was similar with the previous studies (Bitsika, Sharpley and Melhem, 2010; Byram and Bilgel, 2008; Piccinelli and Wilkinson, 2000).

Initial stage of analysis included ANOVA in order to test the ratio of variability and residual variability between the independent and dependent variables. The results showed a positive correlation between the variables with an excellent Cronbach alpha value for BDI-II that was similar to previous studies (Beck et al, 1979; Moore et al., 2014). Results in this study found that the weakest Cronbach alpha was noted for MAQ and matched the study by Senormanci et al., (2013), the results of this study was in contrast with other studies (Ingram et al., 1986; Teasdale et al., 2002; Wells, 2008).

This investigation showed that correlation analysis of Mastery, DAS-24 and ASQ were all significantly correlated with BDI-II scores (Abramson et al., 1978; Hewitt et al., 2004; Nolen-Hoeksema, Girgus and Seligman., 1992) also MAQ scores were correlated, although this did not appear to be as significant as other variables and was not similar to a study by Ingram et al., (1986) who found strong correlation between MAQ and BDI. Further tests of multiple regression and path analysis found that 33% of the variance in BDI scores could be predicted and that Mastery, DAS, ASQ and sub factor of coping (accommodation) showed to have a significant contribution in prediction of BDI scores. Interestingly, in this test MAQ also showed o have a direct correlation. Additionally, a series of path analysis was conducted with Mastery showing the strongest correlation in phase one of the investigations and covariance between mastery and DAS was observed with the same value. The findings from this study were comparable to previous studies where DAS, MAQ, Mastery, ASQ were able to predict BDI (Alloy and Abramson, 1979; Burger, 1984; Emmelkamp and Cohen-Kettenis, 1975; Gadalla, 2009; Lwinsohn, Mischel, Chaplin and Barton, 1980; Rotter, 1966). However, the missing data did not offer confirmatory scores for BIC, especially with smaller models where up to three variables were tested. Interestingly, the covariance correlations considered to be based around limited data set when computed as well as producing a poor modelling structure and therefore additional regression and path analysis were conducted.

Unlike the study by Ilardi and Craighead, (1999) who reported no significant correlation between ASQ and BDI, this study found the link between ASQ and BDI were significantly correlated similar to study by Hewitt et al., (2004) who found ASQ to be a strong predictor of BDI.

Results of coping in the current investigation did not produce a strong correlation with depression or anxiety, unlike previously reported studies (Rick and Guppy, 1994; Guppy et al., 2004). The overall results in this study indicated a less likely role for coping as a predictor of depression or anxiety amongst the non clinical participants, although, results from correlation coefficient and descriptive data found support for coping as a predictor, that was similar to previous studies by Guppy et al, (2004).

Other interesting investigation in this study included the utility of DAS-24 and its sub-factor in prediction of BDI-II with similar findings as Power et al (1994). It was postulated in this study that DAS-24 and its sub-factors could be utilised as a predictive measure of psychological wellbeing. Results from the regression analysis of DAS-24 total scores were less significant and therefore it was considered to be a weak marker for predictability of psychological wellbeing contrary to preceding studies (De Graaf et al., 2009; Moore et al., 2014; Segal et al., 2002). DAS total score as a factor showed poorer scores when compared to three sub-factor scores, interestingly, additional factors seemed markedly improve the scores. This marked difference was notable in DAS success perfection (sub-factor) that showed to have the strongest correlation with depressive presentation and the results from this study was similar to the study by Moore et al., (2014). Otherwise, strong correlations were noted in path analysis that suggested a direct link between DAS-24 total scores as well as its sub-factors scores with depressive symptoms. The contrasting result could be explained by the impact of fragmented or missing data. In order to amend the shortfalls, further analyses were conducted that included factor scores, covariance and Bivariate analysis of variables. This study demonstrated that DAS-24 is a valid measure for the non clinical group of population. In addition, prevalence of depression in cross sectional studies by Weich, Churchill and Lewis (2003) were comparable to this study where an association with dysfunctional attitudes were evident.

As it was hypothesised, this study produced a significant data in support of DAS-24 and other selected measures as a dispositional predictor of psychological wellbeing. The analysis of the internal correlations offered an acceptable Cronbach alpha value for all the selected measures similar to other studies (Alloy and Abramson, 1979; Beck et al, 1979; Guppy et al., 2004; Moore et al., 2014; Parkes et al., 1994; power et al, 1994; Segal et al., 2002; Senormanci et al., 2013).

The overall results from this pilot study supported the hypotheses that DAS-24, ASQ, Mastery and MAQ can predict depressive presentation, namely BDI-II. However, CCS-15 seemed to be less efficient as a predictor of psychological wellbeing compared to previous studies (Guppy and Weatherstone, 1997; Guppy et al, 2004; Park and Adler, 2003).

8.3.2 Study 2: Method and Results of the First Phase of Second Study

Although the results from the pilot study provided a suitable grounds and framework for the prediction of BDI scores, a further data analysis was essential in confirming the findings. This chapter was designed in accordance to fig (4.1) that was based on the review of the pilot study and feedback from transfer of Mphil to PhD. A number of considerations were reviewed and therefore additional changes were adopted. One of the main changes included in chapter four describes the second study of 310 participants where eight sets of measures were utilised and administered electronically using Qualtrics software. A cross sectional sample of non-clinical participants n=310 were recruited from the general population as well as students from the psychology department of Bedfordshire university. Demographic characteristics of the participants ranged between 18 and 70 with mean average age of 35 that included (n=227) female with 78% of participants and male (n=76) 22%. Ethnic composition of the participants included Caucasian (n=254), Black minority (n=4) and other minorities (n=37).

In this stage of the study the measures utilised included Mastery, MAQ, DAS-24, CCS-15, ASQ-6 negative items and following the review from the pilot study, further three measures were included; neuroticism, PHQ9 and GAD7. Therefore, in the next stage of the study further adjustments in analysis and procedures of both measures of anxiety and depression were considered in line with subjective psychological wellbeing. Initially the correlation coefficient and descriptive statistics scores across all measures were tested in prediction of PHQ9 and GAD7. This was followed by a similar investigation conducted at the pilot study, then the data were analysed using ANOVA, multiple regression, confirmatory factor analyses (shown in table. 20) and path analysis as part of the SEM of variance by adhering to the model based on Fan, Thompson and Wang (1999).

Results from this study showed positive correlations with significant value between independent variables and their dependent variables of depression and anxiety. This finding in this study was similar to previous investigations (Hewitt et al., 2004; Kroenke et al, 2001; Spitzer et al, 1999). In order to develop a suitable model, a number of confirmatory factor analyses were conducted along with development of four models with and without mediator effect. Three separate models were developed with different combinations including; a) model with DAS, Mastery and Neuroticism having a direct effect on psychological wellbeing, b) model with MAQ and ASQ as mediators, c) combination of mediator and direct effect and d) all having a direct effect shown in figure 9 (parachute model) with best results from all the identified models. This path diagram and confirmatory analyses helped in further development of a comprehensive model for both anxiety and depression. Therefore a test of reliability and coefficient correlation was conducted indicating a supporting evidence for prediction of depressive symptoms (PHQ9). Similarly, the results of path analysis correlation for GAD7 indicated a good fit for symptoms of anxiety (GAD7). The correlation coefficient and hypothetical models offered in this study produced some interesting results, which were comparative to the results from the pilot study.

An additional path analysis was conducted with the hypothetical model that produced both positive and negative correlations with PHQ9 and GAD7. Mastery, DAS-24 and ASQ appeared to have greater correlation with both PHQ9 and GAD7 compared to other variables in these preliminary analyses with Master, DAS-24 and ASQ predicting psychological wellbeing and the results of this study was notably comparable to previous studies (Abramson, Seligman and Teasdale, 1978; Gadalla, 2009; Hewitt et al., 2004; Moore et al., 2004; Power et al, 1994; Segal et al., 1999). Attention stability correlated strongly with PHQ9 and interestingly, Neuroticism was the most significant indicator of PHQ9. This finding was similar to Hewitt et al, 2004 where both variables could be considered as significant markers for prediction of anxiety symptoms (GAD7). Interestingly, the strongest predictor in this analysis was neuroticism that had been suggested by Van Rijsbergen et al. (2015), although the reported findings were not similar to this study, they considered personality trait as a significant marker of depression and anxiety, this study indicated an approximation of 56% in prediction of (PHQ9) depressive symptoms and 63% probability of prediction for anxiety symptoms (GAD7).

During the initial confirmatory analysis of all variables DAS-24 single item performed poorly compared to the three factor items, this finding was similar to Power et al, (1994). Mastery also showed a significant correlation with PHQ9 that was similar to previous studies (Costa and McCrae, 1989; Emmelkamp and Cohen-Kettenis, 1975; Eysenck and Eysenck; 1975; Gadalla, 2009). Results from this study also showed that Neuroticism significantly correlated with anxiety. The most recognisable factor of personality traits that also has the first phenotype specifically associated to genetic locus and therefore explanation for primary role of neuroticism (Lesch et al, 1996).

A number of publications have reported that neuroticism is a non-specific factor, contributing towards mood and anxiety disorders (Bouton, Mineka and Barlow, 2001) and similar support noted in this investigation.

The path analysis produced similar results to Moore et al., (2014), although they examined the psychometric properties of DAS-A, and its role as a predictor of depression and anxiety. Correlation between DAS-24, depression and anxiety have been investigated and reported in a number of studies (De Graaf et al., 2009; Moore et al., 2004; Segal et al., 1999; Senormanci et al., 2013; Teasdale, 2002; Wells, 2008), although none of the previous studies considered the current combination of measures or hypotheses.

Similarly, the test of reliability, coefficient correlation and path analysis reported in chapter four indicating a developmental and gradual process where the final produced results offered a positive support for the hypotheses with an excellent fit with the model. The results indicated the predictability of depressive and anxiety symptoms with utility of cognitive measures. The results were shadowed by the limitation in data set and the affirmation of findings was further investigated using t-test and subsequent time one and time two analyses.

8.3.3 Study 3: Method and results of the second and third wave

Study three in chapter five investigated the correlations and regressions amongst the variables at time one and time two. Pearson product-moment correlation coefficient and a paired sample t-test across all variables were conducted with *66* participants. The aim of this investigation was to examine the associations between the variables total scores and their sub factors compared with depression and anxiety. Previous studies (Guppy and Weatherston, 1997; Moore et al., 2014; Teasdale et al., 2001) have investigated the correlation between such variables using similar methodology, although none have considered this combination of measures in their investigations.

Regression analysis for PHQ9 at time two was statistically significant and it was comparable to GAD7 scores, whilst the highest correlation coefficient was reported by neuroticism indicating similar to study by Hewitt et al., (2004). A study by Elkin et al., (2006) reported the development of a general functioning scale for patients, following the treatment of depression. They compared the selected measures with measures of wellbeing, coping and BDI, reporting coping as a significant contributor towards wellbeing with 2-4% of variance.

This study assumed a similar methodological approach where the variables were tested and compared with PHQ9 and GAD7. In a paired sample t-test, ASQ produced significant scores with the highest sub-factor of Attention Globality. Surprisingly, low scores were noted for coping, although the correlation and paired sample t-test for coping was significant with the lowest score reported for coping avoidance. Interestingly, Neuroticism produced the highest scores of variance and in contrast, the lowest reported score was noted in coping avoidance, a sub factor of coping measure.

Elkin et al., (2006) reported that coping plays a significant role in the management of symptoms of depression following treatment. However, the result from this study did not produce a significant role for coping and was contrasting to previous studies (Rick and Guppy, 1994; Guppy and Weatherstone, 1997; and Elkin et al., 2006).
The discrepancy between the significance of coping scores could be due to differences in the modes of investigation. Other distinctions maybe due to the type of measures utilised in prediction of the outcomes. Overall, active correlations and covariance were evident across time one and time two with interesting findings for Neuroticism as a significant predictor. This finding may indicate the primary role of neuroticism and personality trait as prescribed previously by Lesch et al., (1996). The primal and sensory responses could be playing a greater role in initiating state of threat to individual's system or alternatively deemed as harmless that could be associated with an individual's personality characteristics.

8.3.4 Study 4: Longitudinal analysis

Chapter six included a longitudinal analysis of correlations and regressions of variables with PHQ9 and GAD7 considered as dependent variables. Unfortunately, this study encountered a greater dropout rate than was expected at this stage of the study (longitudinal phase). This study encountered a greater dropout rate of 20% unlike previous studies by Gollan, Gortner and Dobson, (2006) and Esther de Graaf et al., (2009) reported 8% responses at time two for their non clinical participants.

This study utilised a longitudinal analysis in order to improve the efficacy and reliability of the hypotheses. Similar to the previous studies that had considered a longitudinal analysis in order to examine the efficacy, predictability and reliability of measures (Ilardi et al., 1997; Segal et al., 1999; Zuroff and Blatt, 2006). Other longitudinal studies have examined cognitive pattern, vulnerability, symptomatic experiences, content of cognitive processes and predictability of depression (Iacoviello et al., 2010; Reickman et al., 2006; Segal et al., 2002).

The results in this study indicated that PHQ9 at time two was correlated with other variables with statistically significant scores (Ilardi et al., 1997; Segal et al., 1999; Zuroff and Blatt, 2006). The model summary and correlation scores at time two for PHQ9 showed DAS success perfectionism with the greatest predictability values with an approximation of 62% indicating a strong correlation with both standardised and unstandardised scores. Although this finding was unlike previous studies, the overall results was comparable to previous studies of DAS and its prediction of depressive symptoms (Beck, Perkins, 2004; Moore et al., 2014; Senormanci et al., 2013; Teasdale et al., 2000, 2001). Other notable scores were detected for Mastery where an approximation of predictability stood at 58% in prediction of PHQ9 at time two. Similar correlations were noted for prediction of GAD7 at time two with neuroticism as it was reflected on the results in table 6.2 that suggested an approximation of 53% predictability of variance.

Mastery also produced an approximation probability of 60% in prediction of GAD7 at time two. Interestingly, DAS success and perfectionism showed the highest probability predictor score for GAD7 with 65% at time two. The findings in this study was notably different in that other previous studies (Alloy and Abramson, 1979; Beck et al, 1979; Guppy et al., 2004; Moore et al., 2014; Parkes et al., 1994; power et al, 1994; Segal et al., 2002) have not produced such a high predictability for depression or anxiety.

In addition, a series of multiple regression and confirmatory factor analysis was conducted in response to the limitation of data. The confirmatory analysis and models summary for PHQ9 and GAD7 were developed and further progressed. Following the confirmatory analyses a number of covariance correlations were evident amongst the developed models. The predictors for PHQ9 at time two showed 64%, 74% and 74% in approximation of prediction for the three hypothesised models respectively (appendix.7). Interestingly, Neuroticism showed the highest predictive quality with an approximation of 77% in prediction of PHQ9 at the time two. Similar investigation with GAD7 indicated an approximation of 69%, 71% and 70% in approximation for the three hypothesised models respectively. Interestingly, strong correlations were evident between Attention Globality and Neuroticism, Mastery and GAD7 as well as Neuroticism and GAD7 with value of $p<0.001$. This analysis produced the prediction approximation of 73% for GAD7. It is noteworthy to mention that the findings in these four hypothesised models did not produce the BIC score, which considered being due to the missing data.

Although the fourth factor analysis included Neuroticism that offered a better statistical significance and therefore the role of moderator and mediators were re-examined to establish a better model. This chapter of the study considered the role of mediation and moderation effect similar to previous the study by Oei et al (2006) where four models for mediation and moderation effects were designed and tested. Further analysis of correlation and regression was conducted utilising a path analysis. A hypothetical model was tested producing a number of positive and negative correlations with PHQ9 and GAD7 at time two.

The negative and positive correlations amongst the variables were considered as an indication of their paradoxical relationship amongst the variables. The Mastery, DAS-24 and ASQ appeared to have a greater affiliation with both variables of PHQ9 and GAD7.

The model summary produced an excellent fit that was statistically significant, indicating an approximation of prediction at 74% for PHQ9 at time two. Furthermore, neuroticism offered the greatest predictive correlation in prediction of anxiety symptoms (GAD7) at time two with an excellent fit model. Further path analysis of GAD7 at time 2 produced a significant statistical values, indicating an approximation probability of 71% for prediction of anxiety at time two (GAD7). Other path analysis was conducted without coping as a predictor of psychological wellbeing. The results suggested a better fit with the model as it can be seen in table 6.17 and 6.18. Although the results for this analysis and the model fit provided were considered as a positive finding, the lack of large data set minimised the potential for this investigation. The correlation and path diagram associated with this analysis could be found in appendix 8 and 9. Close scores amongst all variables were evident in this investigation. The similarities between correlations and regressions across a number of variables were unexpected. All of the selected measures produced an excellent reliability with significant Cronbach α matching the previous studies.

8.3.5 Reflection on findings from quantitative study

The current investigation examined the results from regression analysis for PHQ9 that indicated an approximation of 50% in prediction of variables at time two. Interestingly, mastery's probability of prediction for PHQ9 was reported as 58%, a significant predictability of depressive symptoms. However, the greatest predictable marker was DAS success and perfectionism across all indicated variables, with a substantial score of 62% of probability for the prediction of depressive symptoms. Positive correlations were also noted between anxiety symptoms and neuroticism, where an approximation predictability of variable 53% was noted.

Another significant variable was mastery that showed a significant probability of prediction in approximation of 60% for anxiety symptoms. DAS success and perfectionism showed noteworthy probability predictors for anxiety too, with an approximation of 65% in contrast with Illardi et al., (1997) who contested the predictability of depression using DAS, although their findings indicated a correlation with ASQ.

Overall, the test of reliability of PHQ9 and GAD7 were significant and it was comparable to previous studies with a significant Cronbach α value. Otherwise, significant internal reliability of measures was reported with Neuroticism, Mastery and DAS Success and perfectionism. In the path analysis, the model was tested against Mastery, DAS and ASQ, producing a significant correlation with both variables of anxiety and depression. The test of reliability and coefficient correlation for Neuroticism produced an approximation predictability of 74% for symptoms of depression at time two, offering the highest predictor amongst all measures. Additionally, path analysis correlation for GAD7 at time two offered a significant score at an approximation of 71% with an excellent model fit, suggesting a good probability of prediction.

On reflection, the results in here suggest that Neuroticism is the highest predictor followed by mastery for both depression and anxiety. In addition, the role of DAS sub factor of success and perfectionism should be considered as significant in initiation and maintenance of both Depression and anxiety. Therefore utilising these predictors could provide a suitable marker for management of negative symptoms.

Results from the longitudinal data were comparable to hypotheses suggesting that individual's subjective psychological wellbeing could be predicted by cognitive measures at time two. Moreover, an additional path analysis was performed with data without the coping, offering a better model fit. The model fit without coping was reviewed further with an identical outcome. This finding could be seen similar to Neff et al., (2004) who reported the correlation between self-compassion and active coping are the essential contributor to recovery. This could potentially offer a different aspect to the discussion; in that an individual's internal cognitive processes could be highly correlated with coping style or lack of active coping.

One explanation for the better fit with the model in this study could be related to the degree of distress and initiation or utility of coping. Previous studies (Elkin et al., 2006; Katz and Guppy, 1994) examined the properties of coping and found that coping plays a significant role in association with depression and psychological wellbeing in clinical populations. The comparison between coping styles of the non-clinical and clinical participants remains an area of interest and further investigations. The distinction relies on the triggering of coping mechanism when the distress that could be more evident in clinical population rather than non clinical.

Due to shortfall in data and limitation in reported findings an additional study was undertaken. The main rationale for considering a qualitative study included the lack of adequate data sets, namely within the longitudinal section where the hypotheses in previous chapters could be more rigorously tested and confirmed. In addition, the qualitative investigation offers a different perspective in conformation of the hypotheses.

8.3.6 Study 5: Framework Analysis - Clinicians' Views of Cognitive Measures used in Depression and Anxiety

This study recruited 12 clinicians within the field of psychology, psychotherapy and psychiatry. The aim of this study was to examine clinician's views into common variables they consider in the treatment of depression and anxiety, thereby potentially offering a different dimension to the current investigation and further support for the hypotheses. It was postulated that the qualitative data would provide a grounding support for the choice of measures and their potential for predictability. Similar studies have considered this methodological approach such as Chambers et al., (2015) utilised a qualitative methodological approach in examining self-management of patients with long-term depression. Burroughs et al., (2006) study examined clinicians and patient's views in a primary care setting. Intriguingly, responses were very closely matched between patients and clinicians in terms of cause and experiences of depression.

Previous qualitative studies (Howarth et al., 2014; Spendelow, 2015; Railton and Mowat, 2000) investigated the views of clinicians, such as counsellors and general practitioners, in relation to depression, service provision and mode of intervention. The current investigation adopted a similar approach in examination of practitioner's views, utilising a qualitatively based rationale. Although, the intent and outcome in this study was greatly differed with the previous studies the process and procedures were similar.

The current study implemented a thematic analysis approach (Braun and Clarke, 2006) using framework analysis with a cross-sectional descriptive data. This method allowed the different aspects of the topic to be investigated (Ritchie and Lewis 2003). It was postulated that the gathered information would confirm the theoretical position that suggests a direct correlation amongst cognitive measures and prediction of psychological wellbeing.

Following a literature review a study design was considered and adopted that included a semi structured interview. Utility of thematic analysis was considered that enables the development of a generic understanding of the core characteristics of the study (Braun and Clarke, 2006), which also offers a surplus in flexibility of research. Although, thematic analysis is a method of identifying, analysing and reporting themes with the gathered data sets, the actual process could offer a wider range of information. The interview schedule and participant's feedback was recorded. The gathered information from the participants were reviewed and rated separately by the researcher and a colleague. This was done blind to each other with the intention of offering a better test of reliability. The main findings indicated that all previously identified independent variables were contributing at some levels according to the participants. The participant's feedback on DAS-24, ASQ, mastery, MAQ and coping suggested that each measure does have a close and relevant relationship with subjective psychological wellbeing.

One notable observation related to the participant's training modality that appeared to have a significant bearing on their responses and their intended mode of approach in treating individuals with depression and anxiety. Additionally, two of the participants discussed the utility of memory recall and impact of the personality trait during the interview that was not readily reported by the clinicians.

Overall, findings indicated that there are integral relationship within the independent variables that have a coexisting role within the same paradigm, indicating the best mode of response or survival when exposed to stress, depression and anxiety and therefore the most suitable mode to gain recovery.

8.4 Contribution to knowledge

The aim of this study was to explore and affirm the utility of specific cognitive measures in prediction of psychological wellbeing. There have been previous studies where cognitive measures utilities in prediction of depression and anxiety have been extensively examined (Beck, 1976; Burt et al, 1995; Clarke and Beck, 1999; Davey et al, 1992; Guppy et al., 2004; Nebes et al., 2000; Segal et al., 1999; Teasdale et al., 2002).
However, the current research considered and adopted a unique mode of approach both in its utility of measures for prediction of psychological wellbeing and its position for adding to the existing knowledge.

In this instance the utility of cognitive measures and their quality as predictors of subjective wellbeing was the main aim of this study. Although, some of the previous studies have alluded to the predictive quality of specific measures, none have considered similar combination of their utility. Following a systematic review of literature, the study was designed and developed that will be discussed here.

In the first review of wellbeing in the United Kingdom by the Office of National Statistics, it was reported that 1 in 5 (18.3%) of the general population aged 16 and over suffer with anxiety or depression (Evans, Macrory and Randall, 2015).

A systematic review of the literature on the combination of DAS-24, depression and wellbeing produced 726 articles, where 15 publications were reporting DAS as a predictor of depression and only two papers considered DAS-24 and depressive presentation, including Farmer et al., (2001). In total, five studies reported the use of measures in the prediction of depression and anxiety related to psychological wellbeing. Individual's state of wellbeing has been difficult to define, although contributory features of wellbeing could indicate a road map to wellbeing. During the next discussion a simplified and succinct discussion would be reported in order to show the progress and development of this thesis.

The current investigation considered features of subjective wellbeing, namely depression and anxiety. The initial process would include observation and recognition of the distress, followed by a response that meets that demand. Therefore, the primary focus for an individual includes the recognition, understanding and individual's ability to process the gathered information effectively. Additional actions required in form of individual's decision in adopting an appropriate response that addresses that demands on the individual.

The implied demands therefore could highlight a psychological responses recognised as stress, anxiety or depression. Initial focus in this study was on demands leading to the depressive or anxiety based symptomatology. Individual responses to external and internal distress are based on individual's values, motivation and meaning that are associated with experienced stimuli and the manner it is reappraised. The natural progression requires examination of the theoretical concepts and their correlation with psychological wellbeing.

Numbers of studies have indicated that the severity and intensity of depressive presentations could be measured (Beck, 1976; Burt et al, 1995; Clarke and Beck, 1999; Davey et al, 1992; Nebes et al., 2000; Segal et al., 1999; Teasdale et al., 2002), whereas the content of depressive cognition remains concealed, it could be activated at any time, including during remission (Teasdale et al., 2002). The negative cognition could be represented in two formats, cognitive form and cognitive contents, such as dysfunctional thinking (Ingram, Miranda and Segal, 1998; Segal et al., 2002). The distinction between form and content could be understood by the examination of cognitive processes and its subsystems.

Beck, Epstein and Harrison (1983) discussed the concept of vulnerability that relates to the underlying dysfunctional attitudes that partly associated to its sub factors. Therefore examining the depressive presentation would require a greater understanding of processes at both levels form and content that are associated with depression.

Both form and content of cognitive processes could be better understood by reflecting on investigators such as Lazarus (1966, 1991) and Zajonc (1984) that debated the role of appraisals, emotion and understanding of stress. Lazarus's theory (1991) summed as appraisals and reappraisals of a demand and therefore adaptation of an appropriate response. Meaning that every emotional experience requires evaluation or meaning in order to be considered as distressing or otherwise.

However, Zajonc (1984) offered a different proposition, indicating that the primary emotional responses could be initiated in absence of any cognitive processes or evaluation. This debate has been continued further by the role of primary, secondary appraisals and personality traits (Folkman and Lazarus, 1980; Eysenck and Eysenck, 1985; Guppy et al., 2004) that have shown to have an active affiliation with subjective psychological wellbeing. Other studies also have shown that the risk of relapse in depression could be predicted (Beevers et al., 2003; Beck et al., 1979; Segal et al., 2002; Seligman et al., 1999; Teasdale et al., 2001) although limitations in identifying other variables were also highlighted, including global psychological wellbeing.

It is concerning that the majority of researches have focused on the affective state of individuals and populations (Newman, Tay and Diener, 2014; Pavot and Diener, 1993) hence the development of tools in measuring affective wellbeing has been rigorous and wide ranging in nature. Interestingly, when this is compared to psychological wellbeing and life satisfaction tools, the research falls short. Utilising cognitive measures and their relationship with mental health and wellbeing could be helpful in understanding the underlying processes (Folkman and Lazarus, 1984; Lazarus, 1979; Segal, Williams and Teasdale, 2002).

Interestingly, the relationship between cognitive processes and cognitive sub-levels has been another area of debate, especially with regards to clinical treatment (Gilbert, 2012; Hayes, 2010; Williams et al., 2013). Furthermore, Segal et al., (2002) examined extremes of responses and compared this to individual scores, arguing that a greater determinant of prediction may lie in the extremes of responses rather than individual scores.

Other features of cognitive processes could provide a more meaningful outcome such as distinction between cognitive form and cognitive content that is processed with the dysfunctional thinking styles. Interestingly, Teasdale et al., (2001) debated that recognition and review of experiences could enhance or prevent the cognitive processes at meta-cognitive level, postulating a link with worry and rumination as a potential cause for risk of relapse in depression. Other studies such as Segal, Gemar and Williams (1999) examined the sub scores of DAS arguing that DAS sub factors play an important role in the prediction of low mood, as well as risk of relapse in general.

Although, prediction of cognitive processes in clinical setting has been tested in previous studies, similar mode of predictability in non-clinical participants has not been tested. It is understood that dysfunctional scale would offer a suitable scale in assessment of cognitive vulnerability including form and content (Beck et al, 1979). Moreover, the relationship between underlying cognitive processes to vulnerability and depression could be examined using the same measure according to Beck and Weissman (1979) with utility of a shortened version of the dysfunctional attitude scale (40 items). However DAS was modified further to DAS-24 with similar validity and reliability to its previous version (Power et al., 1994).

In a comparative study of clinical and non-clinical population the differences in cognitive insight were tested by Beck and Warman (2004), arguing the role of emotion and cognitive specificity. The differences in cognition and awareness of cognitive processes and their associated features were reported in both clinical and non-clinical populations. Their findings concluded a similar stance to the current investigation of psychological wellbeing by examining cognitive insight, processes and sub systems, although this study also included measures of perception, personality and individual control. The relationship and characteristics of appraisals investigated in a meta-analysis by Beck and Perkins (2001), examining the relationship between cognitive processes and emotional specificity. They highlighted the correlation between cognitive specificity and emotional representation of anxiety and depression.

Teasdale and colleagues (2000) also explored the underlying cognitive processes that are closely associated with markers of psychological wellbeing. Therefore this mixed method study considered an exploration with hypothetical stance that the psychological wellbeing could be predicted in its entirety when a combination of measures considered, therefore offering a potential for management, reduction and most significantly prevention of depression and anxiety.

The current modes of clinical support such as CBT has provided good evidence in the reduction of depressive symptoms (Beck, Rush, Shaw and Emery, 1979) that are also effective for anxiety symptoms (Wells and Carter, 2001). In spite the current therapeutic approaches and positive outcomes in management of depression and anxiety, the current treatment approaches still remains inadequate, due to the characteristics of depression and risk of relapse (Segal, Pearson and Thase., 2003). The shortfall suggests a lack of appropriate targeted interventions for depressive characteristics. Although in recent years interventions such as third wave cognitive therapy, MBCT (Segal et al., 2013) and Compassionate Focus Therapy (Gilbert, 2012), Meta-Cognitive Therapy (Wells, 2008) and Acceptance and Commitment Therapy (Hayes, 2010) have attempted to address these shortfalls.

A Study by Ingram et al., (2007) investigated cognitive processes and attributional biases amongst adolescents, although they were unable to provide an explanation for the prediction of relapse and risk to psychological wellbeing, their findings highlighted their correlations. Also Peterson et al., (2007) reported that an individual's ability in selection of appropriate information processing and adopting a suitable response to a situation is of significance and therefore crucial for maintenance of psychological wellbeing. Their finding argued that the perception of an event and the coping mechanisms utilised are directly associated with prediction and management of psychological distress.

Previous research has identified a number of key features associated with subjective psychological wellbeing; namely, individual's thinking style, a person's ability to recognise thoughts of negative nature, perception or attribution, control, the coping mechanisms utilised in management of distress and an individual's personality characteristics.

However, the current study considered a preventative method of recognition and application of appropriate strategies where individual becomes aware of their risk factors as well as their strengths. Although, the previous studies have considered and reported the variables and their association with depression and anxiety individually, none of the previous studies have combined these features or considered their utility in the same manner as this study. Therefore the current investigation considered possible variables that could predict individual's subjective psychological wellbeing, for example use of DAS-24 (Power et al., 1994) to examine thinking style or dysfunctional attitudes. Meta-cognitive awareness questionnaire (Teasdale et al, 2001) was utilised for assessing internal insight of one's state of subjective psychological wellbeing. Attributional style questionnaire (Peterson et al, 1982) was adopted in accordance with Hewitt et al (2004), examining only negative aspects of an individual's perception and its relationship with depressive presentation. Mastery or control (Pearlin and Schooler, 1978) was adopted in assessing an individual's degree of control over their general life.

Eysencks Personality Inventory (1964) has shown to have good reliability and its contributory factors were strongly correlated in the prediction of psychological wellbeing. The results from this study indicated that the correlation between coping and psychological wellbeing are evident when an individual is exposed to distress, more importantly specific sub factors are closely associated with depression or anxiety. The personality trait has a direct effect on choice of coping strategies utilised or avoided. Therefore Cybernetic Coping and its five sub-factors were considered to be closely associated with the mode or choice of coping style that an individual adopts, helping them to recovery from distress.

Edward's (1992) original cybernetic coping scale was changed later by Edwards and Baglioni (1993) and further modified by Guppy et al., (2004) reducing the measure to the 15 items version with similar reliability. The correlation between coping and psychological distress and state of wellbeing are closely associated (Guppy and Weatherstone, 1997; Guppy et al., 2004, Rick and Guppy, 1994).

Although, a number of strong correlations were detected in this investigation, there was also a notable lack of impact; the scores of coping measure being consistently weak and seemed less relevant compared to other variables. This low score could be due to the non-clinical participant's responses of coping. Interestingly, a study by Elkin et al., (2006) found strong evidence amongst a clinical population for the prediction of psychological wellbeing and recovery from depression and coping. Other key issues highlighted in this investigation included Neuroticism scores that proved to have a closer role than previously considered in the prediction of depression and anxiety. This could be due to the first phenotype specifically associated to genetic locus (Lesch et al, 1996). DAS-24 sub factors of success and perfection showed significant correlation in predicting both depression and anxiety. Other independent variables produced significant correlation as the findings had confirmed active correlation between these measures and their ability to predict subjective psychological wellbeing. The results provided support for the hypotheses that psychological wellbeing could be predicted when utilising specific sets of measures. In addition to the current knowledge, the results could increase researchers understanding in considering the use of cognitive measures that consists of cognitive processes and its sub systems as contributory markers of subjective psychological wellbeing.

The findings providing a clear message that there are specific markers that could predict psychological wellbeing and these determinants could be utilised in form of prevention as well as treatment of distress, depression and anxiety, therefore supporting a positive process to recovery. This study postulated that the prediction of psychological wellbeing could be predicted when utilising a specific measures and therefore offering an inventive approach in improving and management of psychological wellbeing.

8.5 Concluding remarks

This section is dedicated to summarising the broader findings and an overall outcome of the project. The intention of this project was to highlight the role of specific cognitive measures and their utility as predictors of psychological wellbeing. In order to develop a strategic plan a plethora of research were examined and reported findings elaborated on the fact that psychological wellbeing has multi-dimensional features associated with cognitive processes. Folkman and Lazarus (1986) view of appraisal was the corner stone of this study, reviewing and examining the role of primary and secondary appraisals in regaining state of equilibrium in terms of subjective wellbeing.

Investigation of features such as thinking style, attribution bias, awareness of thoughts and feelings seemed a logical approach in addition of considering variables such as individual's coping style. Other aspects of investigation considered individual characteristics and personality traits that are also shown to significantly correlate with subjective psychological wellbeing. The structural and sub factorial features of each variable (measures in this study) played a great role in deciding the outcome, namely symptoms of anxiety and depression as well as choice of coping style.

This study hypothesised a method whereby cognitive measures could predict psychological wellbeing. This understanding would offer an important opportunity for individual's ability to manage their emotional health, occupational health and its subsequent benefit to the society in general. Following a systematic review and a series of analysis a sets of questionnaire were selected. The identified measures were further investigated in preparation for design and the development of the research.

Intriguingly, there were no publications that considered a multi-dimensional approach where seven cognitive measures and their utility as an assessment tool in prediction of the subjective psychological wellbeing. Although, the majority of publications suggested the potential for measures such as DAS-24, ASQ and MAQ, as yet none have combined all these measures and applied their utility in this manner. The utility of measures was considered in depth, examining their quality as predictors of psychological wellbeing. In addition other variables were considered for their role as moderator or mediators in prediction of depression and anxiety.

This study considered four main phases with each phase offering different stages of the analysis in confirmation of the hypotheses. The four main phases included; a) the pilot study, b) investigation of multiple regressions, coefficient correlations and review of measures, series of developmental path analysis and affirmation of a model for theorised hypotheses, including time one and time two t-test, correlation covariance and coefficient scores, c) longitudinal investigation of reliability and validity of independent and dependent variables, introduction of models for correlations amongst the variables and finally d) a qualitative study was conducted to examine the clinician's views and reviewing the possible markers of psychological wellbeing in clinical practice.

The overall outcome of the study offered a reasonable ground in support for utility of cognitive measures as predictors of psychological wellbeing. The study initially explored the measures role in a pilot study where the potentials and hypotheses were tested. Outcome of the pilot study suggested a strong positive correlation between the independent variables and BDI-II. In addition a series of path analysis was conducted in order to develop a more comprehensive model that offered the best fit. Utility and suitability of measures was reviewed and amendments to the measures were applied.

Results of the second wave of this study and path analysis offered an additional support in predictive quality of the selected measures and their utility. A number of correlations and covariance variables were notable that further enhanced the hypotheses. Other assessments of the data were conducted at time and time two, comparing the findings and developing a more comprehensive understanding of the significant markers that could predict the subjective psychological wellbeing. Longitudinal analysis offered an addition support in affirming the theoretical model and this was demonstrated amongst the variables predictive qualities across time.

This study was incomparable to the previous studies and offered a unique stand point of view. The main observation with reference to such distinction related to the lack of utility of similar combination of measures. Furthermore, this study considered a more comprehensive set of measures in prediction of subjective psychological wellbeing, unlike to any previous investigations. In terms of contribution to research and humanity, this finding offers a platform for consideration of preventative approach to distress, anxiety and depression. In addition, the utility of similar method could be utilised in clinical practice where specific markers could provide explanation for the experienced distress. Therefore adopting a more approach intervention, hence improving treatment outcome. Other findings of note related to importance of Neuroticism throughout the study, highlighting the impact and effect of personality traits on psychological wellbeing and coping in general.

In conclusion, the results from this study demonstrated correlations and covariance between primary and secondary appraisals and their role as predictors of psychological wellbeing. The knowledge gained from this research offers a greater understanding of the interaction between the cognitive processes and cognitive systems in general, also highlighting their impact on different adaptive responses. This study offered a series of models and their correlation in predicting depression and anxiety. In addition the impact of specific variables and their role was of interesting find, namely Neuroticism, Mastery, Attention Globality and their correlation with depression and anxiety. The present investigation highlighted a method that could be utilised in better understanding of the pathway in recognition and prediction of the subjective psychological wellbeing and mental health.

8.6 Limitations of the study

Whilst this study has shown a number of strengths, similar to other investigations it was not without some limitations. During the exploratory stage of this study, the selection of one measure of depression (BDI-II) at the pilot study phase was considered a limitation due to the lack of consideration for anxiety and global measurement whilst assessing for subjective psychological wellbeing.

Other noted limitations in the pilot study included the lack of utility of neuroticism or negative affectivity, which was found to be highly significant in the main section of the study. Amendment to the pilot study offered the needed improvement in addressing the identified shortfalls.

One of the most critical limitations of the current investigation included difficulties with recruitment and sample size. This was especially notable with regards to the longitudinal study and analysis that required. The lack of data in this section did not provide confirmatory grounds for the findings.

Therefore an increase in sample size and addition of follow up at the later date could potentially address such short fall. Furthermore, consideration for allocation of a longer period of time for data collection could enhance the future findings, thereby potentially offering a better outcome.

It is noteworthy to mention that the original design of the study was modified and adopted due to a limitation in resources (one researcher and supervisory team). The lack of resource restricted the investigation to include a clinical sample.

Other issues of consideration included the lack of utility of global measurement of wellbeing. The use of measures such as (General Health Questionnaire; GHQ and Quality of Life Questionnaire), although considered, were deemed to be time taxing for participants. Additionally, consideration of such measures also would have enhanced the demographic and overall understanding of psychological wellbeing.

Statistical limitations were also noted where data analysis failed to adequately load and therefore a number of measures were considered and performed in addressing the challenges, this included reversing items, Listwise analysis and modification of the model, namely lack of score for BIC did not offer a strong supporting grounds for the model fit when tested with smaller models. Although, other scores of confirmatory analysis provided a suitable outcome in confirming the findings. The lack of score for BIC could be explained due to missing data and some limitations in sample size, as well as fragmentation of data sets that could have hindered the positive results with smaller models.

8.7 Future directions

This research provided an initial step in considering the cognitive measures as tools for predictions of the subjective psychological wellbeing. The current investigation indicated a number of possible potential for developing a firmer theoretical explanation for prediction of psychological wellbeing.

However, future opportunities for further research would enable these findings to be re-examined and affirmed with a larger sample size. Otherwise, this study should be retested with other groups of populations, such as adolescents, as well as in treatment or inpatient populations. Only the findings from these investigations would offer conclusive evidence to the findings from this study.

There were a number of surprising observations and findings that could be further examined such as the role of sub factors and prediction of depression. Other interesting findings included the results from the path analysis, when coping was removed from analysis. The scores offered a better model fit that could suggest a potential explanation for the assessment of the hypothesised model in a clinical setting. The hypotheses from this study also could be tested in future studies using clinical samples, thereby potentially providing a clearer explanation and possible better fit with model that includes both with and without the coping variable.

Other investigations may be considered where the prediction of psychological wellbeing could be examined in different sets of cultures. The possibility of investigating this study in different culture may highlight the different style of coping, personality traits, and impact of demographics or wealth that had not been fully considered in this study.

Other future studies could consider similar approach to Teasdale et al., (2002) by examining the measures of extremes of responses rather than the item scores, thus providing a broader understanding of psychological wellbeing and its features. This idea could be further enhanced with a repeat test of their predictability and identification of psychological wellbeing.

In chapter seven of this study a qualitative approach was utilised with indication on the training modality of clinician, indicating a significant bearing on the participant's responses and method of intervention offered in their practice. Future studies may need to consider this finding and plan to investigate the differences between styles of training and core professions that could be more streamlined with a more unified mode of approach and understanding or otherwise.

It is anticipated that having a clearer understanding of underlying markers of distress, cognitive processes and sub level systems, our understanding would be enhanced and reflected in the therapeutic style. This change in approach could provide a better ground for a positive reduction in levels of depression and anxiety better management of possible relapse.

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Appendices

Appendix 1: Questionnaire

Please reply to all items

1. Biographic details

Biographical Details: Please complete the following sections	
Gender Male Female	Age ……..years Year: 1 2 3 Ethnicity: ……

☐

2. Personal control in general life

This section asks about the DEGREE of CONTROL OR INFLUENCE you have over YOUR LIFE. *Circle your response choice for each item on the table.*

ITEMS	**STRONGLY AGREE**	**AGREE**	**DISAGREE**	**STRONGLY DISAGREE**
1. I have little control over the things that happen to me.	1	2	3	4
2. There is really no way I can solve some of the problems I have	1	2	3	4
3. There is little I can do to change many of the important things in my life.	1	2	3	4
4. I often feel helpless in dealing with the problems of life.	1	2	3	4
5. Sometimes I feel that I'm being pushed around in life.	1	2	3	4
6. What happens to me in the future mostly depends on me.	1	2	3	4
7. I can do just about anything I really set my mind to.	1	2	3	4

3. Thought awareness

Please read each item carefully and mark the appropriate number opposite the statement.

ITEMS	Totally disagree	Disagree very much	Disagree slightly	Neutral	Agree slightly	Agree very much	Totally Agree
1) If something has upset me, I try to put my judgements on hold for a while	1	2	3	4	5	6	7
2) When I get low, my feelings show things in their true light.	1	2	3	4	5	6	7
3) When I get low, I remind myself that I may be seeing things as more negative than they really are.	1	2	3	4	5	6	7
4) I trust my own way of seeing things when I feel depressed.	1	2	3	4	5	6	7
5) If I am feeling low, I know my thoughts and feelings are not necessarily realistic.	1	2	3	4	5	6	7
6) When I am down, I can see things as they really are.	1	2	3	4	5	6	7
7) When I am depressed, I am aware that there could be other ways of viewing the situation.	1	2	3	4	5	6	7
8) When I am depressed, I am sure that things really are as bad as they seem.	1	2	3	4	5	6	7
9) I can't trust my judgments about myself when I feel down.	1	2	3	4	5	6	7

Appendices

4. Thinking style questionnaire

This inventory lists different attitudes or beliefs which people sometime hold. Please indicate how much you agree or disagree with each statement and circle your answer on the scale provided which follows each statement. There are no right or wrong answers. It is worth bearing in mind the following guide when choosing your alternative: "does this alternative best describe how I think?" or "does it relate to me most of the time?". Please use the scale provided to guide your answers. There are a total of 24 items below, rate the items from 1-7 in the boxes, 1=Totally disagree, 2=Disagree very much, 3=Disagree slightly, 4=Neutral, 5=Agree slightly, 6=Agree very much, 7=Totally agree.

ITEMS	Totally disagree	Disagree very much	Disagree slightly	Neutral	Agree slightly	Agree very much	Totally Agree
1) If I fail partly, it is as bad as being a complete failure.	1	2	3	4	5	6	7
2) People will probably think less of me if I make a mistake.	1	2	3	4	5	6	7
3) My life is wasted unless I am a success.	1	2	3	4	5	6	7
4) If I don't set the highest standards for myself, I am likely to end up a second rate person.	1	2	3	4	5	6	7
5) If I am to be a worthwhile person, I must be truly outstanding in at least one major respect.	1	2	3	4	5	6	7
6) I must be a useful, productive, creative person or life has no purpose.	1	2	3	4	5	6	7
7) If I do not do well all the time, people will not respect me.	1	2	3	4	5	6	7
8) People who have good ideas are more worthy than those who do not.	1	2	3	4	5	6	7
9) If others dislike you, you cannot be happy.	1	2	3	4	5	6	7
10) My happiness depends more on other people than it does on me.	1	2	3	4	5	6	7
11) What other people think about me is very important.	1	2	3	4	5	6	7
12) I am nothing if a person I love doesn't love me.	1	2	3	4	5	6	7
13) If you don't have other people to lean on, you are bound to be sad.	1	2	3	4	5	6	7
14) I can find happiness without being loved by another person	1	2	3	4	5	6	7
15) I do not need the approval of other people in order to be happy.	1	2	3	4	5	6	7
16) A person doesn't need to be well liked in order to be happy	1	2	3	4	5	6	7
17) I should be happy all the time.	1	2	3	4	5	6	7
18) I should always have complete control over my feelings.	1	2	3	4	5	6	7
19) I ought to be able to solve my problems quickly and without a great deal of effort.	1	2	3	4	5	6	7
20) A person should be able to control what happens to them.	1	2	3	4	5	6	7
21) It is possible for a person to be scolded and not get upset.	1	2	3	4	5	6	7
22) A person should do well at everything they undertake.	1	2	3	4	5	6	7
23) Whenever I take a chance or risk, I am only looking for trouble.	1	2	3	4	5	6	7
24) If I try hard enough, I should be able to excel at anything I attempt.	1	2	3	4	5	6	7

Appendices

5. Coping

People use a variety of different coping techniques to manage the many different situations in which they feel under stress. Listed below are a number of techniques that people have said they use to help them in these stressful situations. Please respond to each of the following statements in order to describe the way you GENERALLY handle stressful situations. Please circle the response of your choice on the scale provided alongside each item.

	I do not use this	I seldom use this	I sometimes use this	I frequently use this technique	I always use this
1) I try to change the situation to get what I want	1	2	3	4	5
2) I make an effort to change my expectations.	1	2	3	4	5
3) I try to keep myself from thinking about the problem.	1	2	3	4	5
4) I try to let off steam.	1	2	3	4	5
5) I focus my efforts on changing the situation.	1	2	3	4	5
6) I tell myself the problem is unimportant	1	2	3	4	5
7) I try to turn my attention away from the problem	1	2	3	4	5
8) I try to relieve my tension somehow	1	2	3	4	5
9) I work on changing the situation to get what I want	1	2	3	4	5
10) I try to adjust my expectations to meet the situation	1	2	3	4	5
11) I tell myself the problem wasn't so serious after all	1	2	3	4	5
12) I try to get it off my chest	1	2	3	4	5
13) I try to adjust my own standards	1	2	3	4	5
14) I tell myself the problem wasn't such a big deal after all	1	2	3	4	5
15) I try to avoid thinking about the problem	1	2	3	4	5

Appendices

6. Patient Health Question

PHQ- 9

Over the <u>last 2 weeks</u>, how often have you been bothered by any of the following problems?		Not at all	Several days	More than half the days	Nearly every day
1	Little interest or pleasure in doing things	0	1	2	3
2	Feeling down, depressed, or hopeless	0	1	2	3
3	Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4	Feeling tired or having little energy	0	1	2	3
5	Poor appetite or overeating	0	1	2	3
6	Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7	Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8	Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9	Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
		PHQ9 total score			☐

7. General Anxiety

Over the <u>last 2 weeks</u>, how often have you been bothered by any of the following problems?		Not at all	Several days	More than half the days	Nearly every day
1	Feeling nervous, anxious or on edge	0	1	2	3
2	Not being able to stop or control worrying	0	1	2	3
3	Worrying too much about different things	0	1	2	3
4	Trouble relaxing	0	1	2	3
5	Being so restless that it is hard to sit still	0	1	2	3
6	Becoming easily annoyed or irritable	0	1	2	3
7	Feeling afraid as if something awful might happen	0	1	2	3
		GAD7 total score			☐

Appendices

Negative affectivity

Instruction;
Please answer each question by circling on an appropriate response to that specific statement ranging from not at all to extremely. There are no right or wrong responses and no trick questions. Work quickly and don't think too long on exact meaning of the questions.

Items	not at all	Slightly	Moderately	Very much	Extremely
1) Does your mood often go up and down?	1	2	3	4	5
2) Do you ever feel miserable for no reason?	1	2	3	4	5
3) Are you an irritable person?	1	2	3	4	5
4) Are your feelings easily hurt?	1	2	3	4	5
5) Do you often feel "fed-up"?	1	2	3	4	5
6) Would you call yourself a nervous person?	1	2	3	4	5
7) Are you a worrier?	1	2	3	4	5
8) Would you call yourself tense or "highly-strong"?	1	2	3	4	5
9) Do you worry too long after an embarrassing experience?	1	2	3	4	5
10) Do you suffer from nerves?	1	2	3	4	5
11) Do you often feel lonely?	1	2	3	4	5
12) Are you often troubled about feelings of guilt?	1	2	3	4	5

Appendices

8. Perception

DIRECTIONS

Please try to vividly imagine yourself if the situations that follow. If such a situation happened to you, what would you feel would have caused it? While events may have many causes, we want you to pick only one-the major cause if this event happened to you. Please write this cause in the blank provided after each event. Next we want you to answer some questions about the cause and a final question about the situation. To summarise, we want you to:

1) Read each situation and vividly imagine it happening to you.

2) Decide what you believe would be the one major cause of the situation if it happened to you.

3) Write this cause in the blank provided.

4) Answer three questions about the cause by circling one number per question. Do not circle the words.

5) Go on the next situation.

Questions

1) YOU HAVE BEEN LOOKING FOR A JOB UNSUCCESSFULLY FOR SOME TIME.

Write down the one major cause: _____

Is the cause of your unsuccessful job search due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1 2 3 4 5 6 7	Totally due to me

In the future when you look for a job, will this cause again be present?

Will never again be present	1 2 3 4 5 6 7	Will always be present

Is the cause something that just influences looking for a job, or does it also influences other areas of your life?

Influences just this particular situation	1 2 3 4 5 6 7	Influences all situations in my life

2) YOU GIVE AN IMPORTANT TALK IN FRONT OF A GROUP AND THE AUDIENCE REACTS NEGATIVELY.

Write down the one major cause: _____

Is the cause of the audience's negative reaction due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1 2 3 4 5 6 7	Totally due to me

In the future when you give talks, will this cause again be present?

Will never again be present	1 2 3 4 5 6 7	Will always be present

Is the cause something that just influences giving talks, or does it also influence other areas of your life?

Influences just this particular situation	1 2 3 4 5 6 7	Influences all situations in my life

Appendices

3) YOU CAN'T GET ALL THE WORK DONE THAT OTHERS EXPECT OF YOU.

Write down the one major cause: _____

Is the cause of you're not getting the work done due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1 2 3 4 5 6 7	Totally due to me

In the future when doing work that others expect, will this cause again be present?

Will never again be present	1 2 3 4 5 6 7	Will always be present

Is the cause something that just affects doing work that others expect of you, or does it also influence other areas of your life?

Influences just this particular situation	1 2 3 4 5 6 7	Influences all situations in my life

4) A FRIEND COMES TO YOU WITH A PROBLEM AND YOU DON'T TRY TO HELP HIM/HER.

Write down the one major cause: _____

Is the cause of your not helping your friend due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1 2 3 4 5 6 7	Totally due to me

In the future when a friend comes to you with a problem, will this cause again be present?

Will never again be present	1 2 3 4 5 6 7	Will always be present

Is the cause something that just affects what happens when a friend comes to you with a problem, or does it also influence other areas of your life?

Influences just this particular situation	1 2 3 4 5 6 7	Influences all situations in my life

5) YOU MEET A FRIEND WHO ACTS HOSTILELY TOWARDS YOU.

Write down the one major cause: _____

Is the cause of your friend acting hostile due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1 2 3 4 5 6 7	Totally due to me

In the future when interacting with friends, will this cause again be present?

Will never again be present	1 2 3 4 5 6 7	Will always be present

Is the cause something that just influences interacting with friends, or does it also influences other areas of your life?

Influences just this particular situation	1 2 3 4 5 6 7	Influences all situations in my life

Appendices

6) YOU GO OUT ON A DATE AND IT GOES BADLY.
Write down the one major cause: _____

Is the cause of the date going badly due to something about you or something about other people or circumstances?

Totally due to other people or circumstances	1 2 3 4 5 6 7	Totally due to me

In the future when you are dating, will this cause again be present?

Will never again be present	1 2 3 4 5 6 7	Will always be present

Is the cause something that just influences dating, or does it also influence other areas of your life?

Influences just this particular situation	1 2 3 4 5 6 7	Influences all situation in my life

Are you currently stressed or worried due to a past, recent or upcoming event? ☐ **Yes** **No**

Please provide the following final information in order to match responses over time.

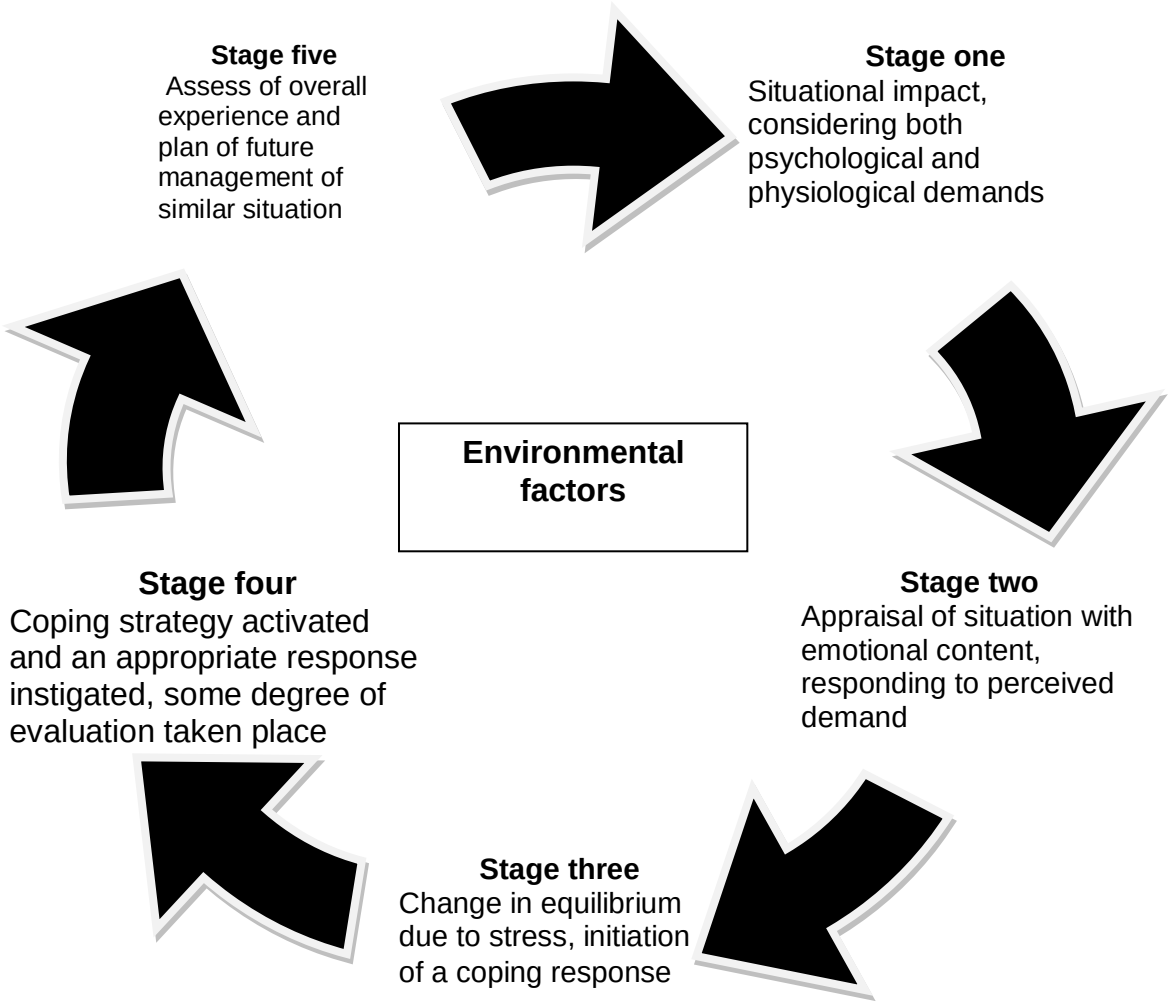
Your mother's first name or maiden name ……

The month you were born ……

THANK YOU FOR YOUR ASSISTANCE IN THIS RESEARCH. IF YOU WOULD LIKE MORE INFORMATION ABOUT OUR FINDINGS, PLEASE CONTACT:
FARAMARZ HASHEMPOUR, DR. HOSSEIN KAVIANI OR PROF. ANDY GUPPY, UNIVERSITY OF BEDFORDSHIRE.

Appendices

Appendix 2: Cox's model of stress (1985; 1987)



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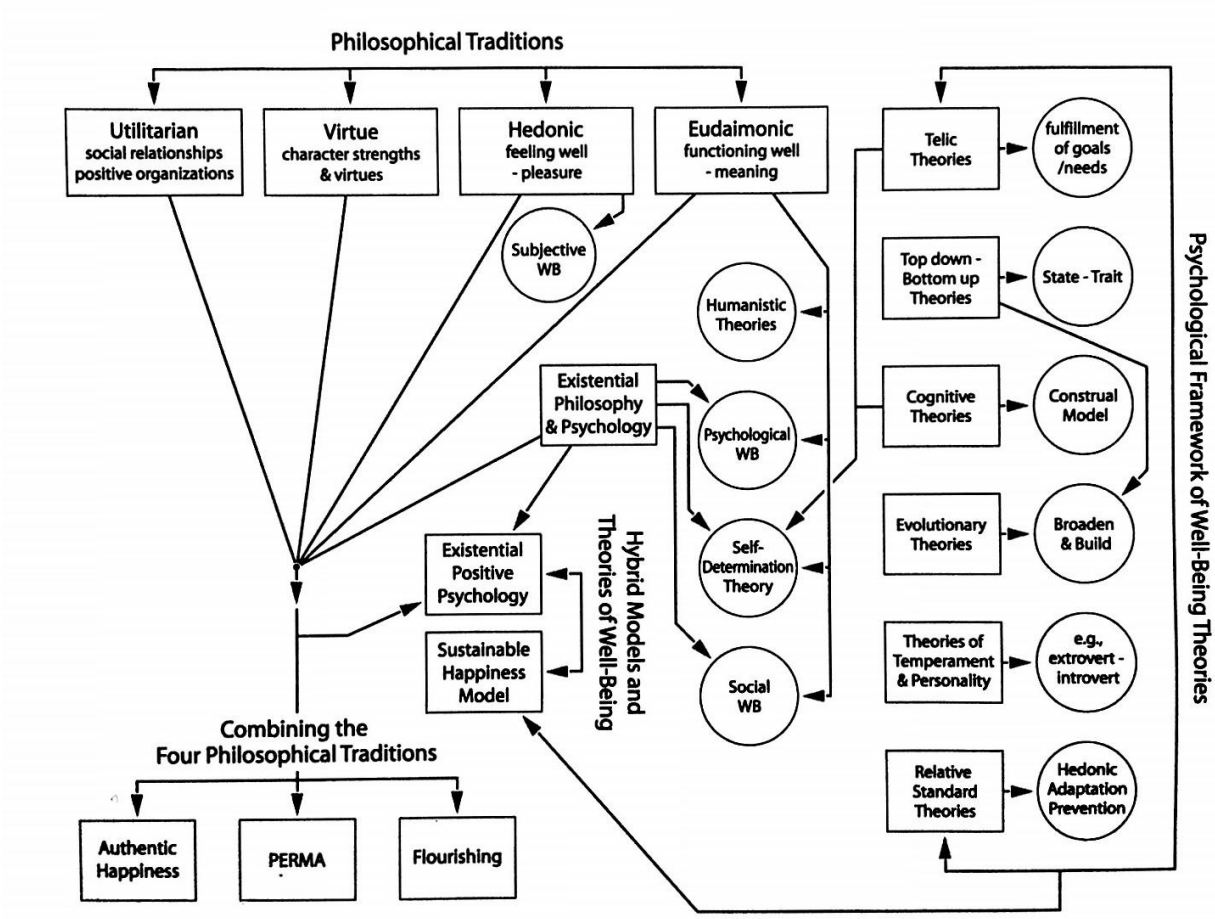
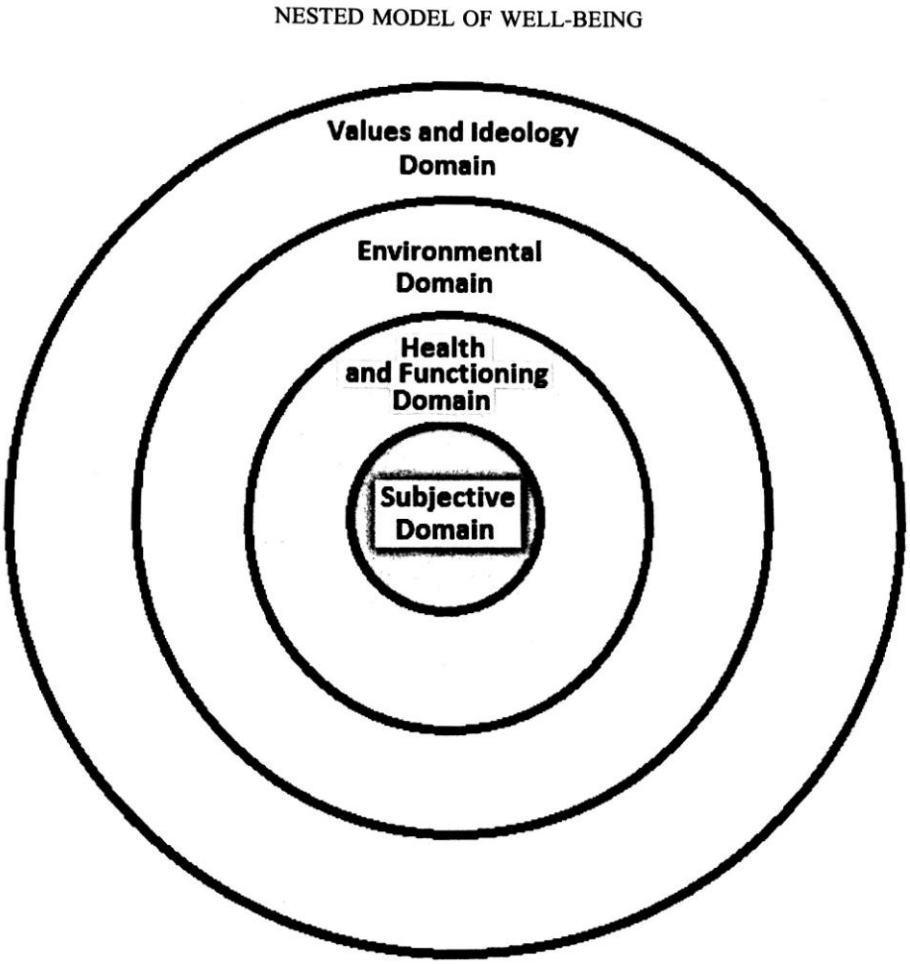
Appendix 3: Roadmap of wellbeing (Lambert, Passmore and Holder, 2015)



Appendices

Appendix 4: The Nested Model of Wellbeing (Henriques, 2011) cited in Henriques et al. (2014)



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Appendix 5: Weiner (1985)

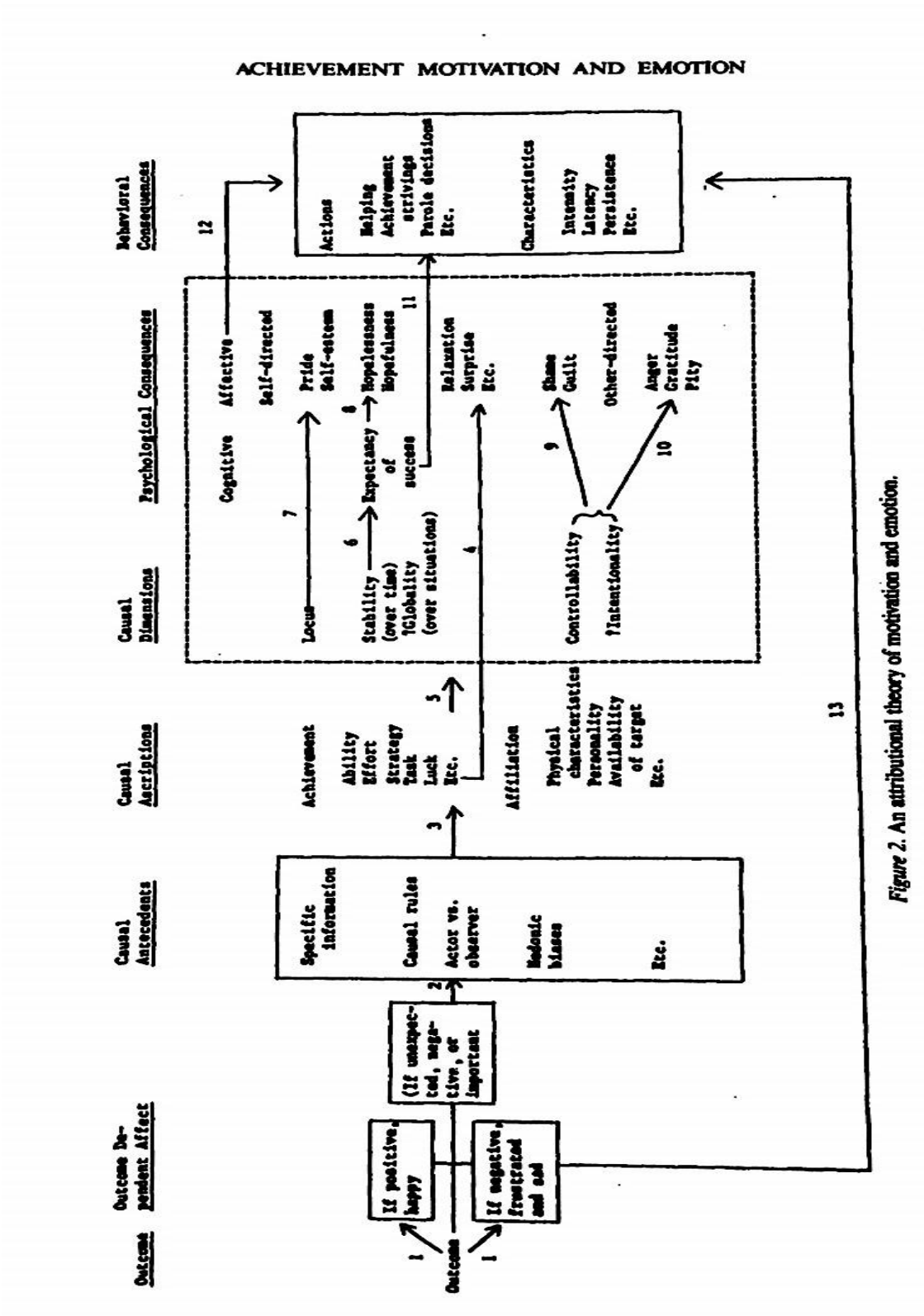

Figure 2. An attributional theory of motivation and emotion.

Appendices

Appendix 6 CFA for BDI, ASQ, ASQ Sub factors, DAS, DAS sub factors, MAQ, Mastery and Coping

CFA for BDI

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	13	2.064	1	.151	2.064
Saturated model	14	.000	0		
Independence model	8	291.497	6	.000	48.583

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.993	.958	.996	.978	.996
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.167	.165	.166
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	1.064	.000	9.497
Saturated model	.000	.000	.000
Independence model	285.497	233.277	345.131

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.016	.008	.000	.074
Saturated model	.000	.000	.000	.000
Independence model	2.277	2.230	1.822	2.696

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.091	.000	.272	.214
Independence model	.610	.551	.670	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	28.064	29.121		
Saturated model	28.000	29.138		
Independence model	307.497	308.147		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.219	.211	.285	.228
Saturated model	.219	.219	.219	.228
Independence model	2.402	1.994	2.868	2.407

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	239	412
Independence model	6	8

Result (Default model)

Minimum was achieved
Chi-square = 2.064
Degrees of freedom = 1
Probability level = .151

Appendices

Appendix 6

Alternative CFA for BDI

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	61	354.422	170	.000	2.085
Saturated model	230	.000	0		
Independence model	40	1098.731	190	.000	5.783

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.677	.639	.801	.773	.797
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.895	.606	.713
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	184.422	134.264	242.344
Saturated model	.000	.000	.000
Independence model	908.731	808.215	1016.736

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	2.769	1.441	1.049	1.893
Saturated model	.000	.000	.000	.000
Independence model	8.584	7.099	6.314	7.943

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.092	.079	.106	.000
Independence model	.193	.182	.204	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	476.422	500.366		
Saturated model	460.000	550.280		
Independence model	1178.731	1194.432		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	3.722	3.330	4.175	3.909
Saturated model	3.594	3.594	3.594	4.299
Independence model	9.209	8.424	10.053	9.332

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	73	78
Independence model	26	28

Result (Default model)
Minimum was achieved
The model is probably unidentified. In order to achieve identifiability, it will probably be necessary to impose 1 additional constraint.
Chi-square = 354.422
Degrees of freedom (corrected for nonidentifiability) = 170
Probability level = .000

Path diagram of BDI-II

Appendices

Appendix 6

CFA for ASQ

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	75	168.888	114	.001	1.481
Saturated model	189	.000	0		
Independence model	36	604.043	153	.000	3.948

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.720	.625	.888	.837	.878
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.745	.537	.654
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	54.888	24.027	93.732
Saturated model	.000	.000	.000
Independence model	451.043	379.226	530.421

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.319	.429	.188	.732
Saturated model	.000	.000	.000	.000
Independence model	4.719	3.524	2.963	4.144

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.061	.041	.080	.169
Independence model	.152	.139	.165	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	318.888	345.034		
Saturated model	378.000	443.890		
Independence model	676.043	688.593		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	2.491	2.250	2.795	2.696
Saturated model	2.953	2.953	2.953	3.468
Independence model	5.282	4.721	5.902	5.380

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	107	116
Independence model	39	42

Result (Default model)

Minimum was achieved
Chi-square = 168.888
Degrees of freedom = 114
Probability level = .001

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Appendix 6

CFA for ASQ 3 sub factors

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	39	145.414	51	.000	2.851
Saturated model	90	.000	0		
Independence model	12	539.626	78	.000	6.918

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.731	.588	.807	.687	.795
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.654	.478	.520
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	94.414	62.147	134.328
Saturated model	.000	.000	.000
Independence model	461.626	391.722	539.016

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.667	.433	.285	.616
Saturated model	.000	.000	.000	.000
Independence model	2.475	2.118	1.797	2.473

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.092	.075	.110	.000
Independence model	.165	.152	.178	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	223.414	228.360		
Saturated model	180.000	191.415		
Independence model	563.626	565.148		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.025	.877	1.208	1.048
Saturated model	.826	.826	.826	.878
Independence model	2.585	2.265	2.940	2.592

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	103	117
Independence model	41	45

Minimization: .005
Miscellaneous: .266
Bootstrap: .000
Total: .271

Result (Default model)

Minimum was achieved
Chi-square = 145.414
Degrees of freedom = 51
Probability level = .000

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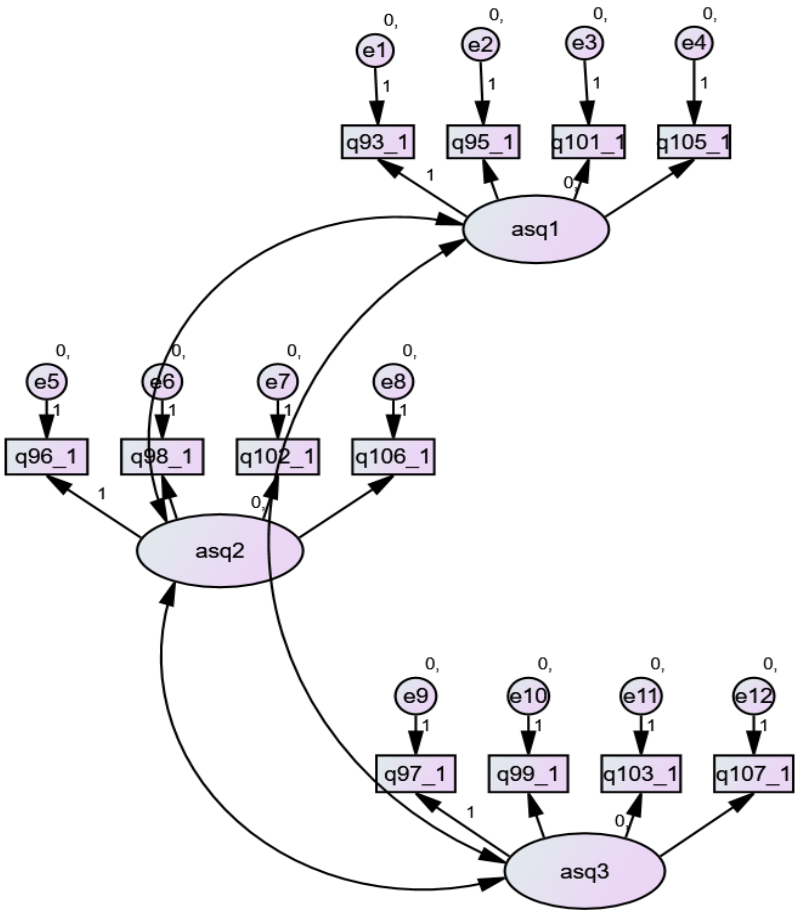
A confirmatory analysis of the ASQ with its three sub factors was carried out as shown in the diagram below.



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Appendix 6

CFA for DAS total

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	12	.918	2	.632	.459
Saturated model	14	.000	0		
Independence model	8	40.484	6	.000	6.747

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.977	.932	1.028	1.094	1.000
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.333	.326	.333
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	.000	.000	4.973
Saturated model	.000	.000	.000
Independence model	34.484	17.957	58.497

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.007	.000	.000	.039
Saturated model	.000	.000	.000	.000
Independence model	.316	.269	.140	.457

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.000	.000	.139	.714
Independence model	.212	.153	.276	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	24.918	25.893		
Saturated model	28.000	29.138		
Independence model	56.484	57.134		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.195	.203	.242	.202
Saturated model	.219	.219	.219	.228
Independence model	.441	.312	.629	.446

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	836	1285
Independence model	40	54

Result (Default model)

Minimum was achieved
Chi-square = .918
Degrees of freedom = 2
Probability level = .632

CFA for DAS-24 total alternative

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	72	810.362	252	.000	3.216
Saturated model	324	.000	0		
Independence model	24	2078.287	300	.000	6.928

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Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.610	.536	.694	.626	.686
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.840	.512	.576
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	558.362	476.066	648.258
Saturated model	.000	.000	.000
Independence model	1778.287	1637.499	1926.508

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	3.717	2.561	2.184	2.974
Saturated model	.000	.000	.000	.000
Independence model	9.533	8.157	7.511	8.837

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.101	.093	.109	.000
Independence model	.165	.158	.172	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	954.362	973.015		
Saturated model	648.000	731.938		
Independence model	2126.287	2132.504		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	4.378	4.000	4.790	4.463
Saturated model	2.972	2.972	2.972	3.358
Independence model	9.754	9.108	10.434	9.782

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HOELTER

Model	HOELTER .05	HOELTER .01
Default model	79	83
Independence model	36	38

Minimization: .039
Miscellaneous: .473
Bootstrap: .000
Total: .512

Result (Default model)

Minimum was achieved
Chi-square = 810.362
Degrees of freedom = 252
Probability level = .000

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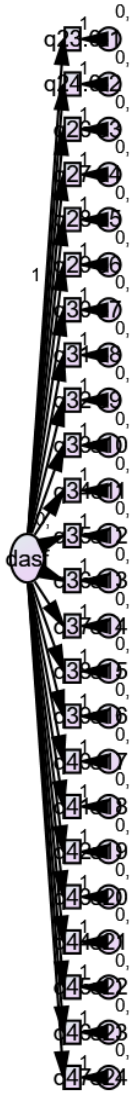

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CFA for DAS three sub factor factors

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	75	542.448	249	.000	2.179
Saturated model	324	.000	0		
Independence model	24	2078.287	300	.000	6.928

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.739	.686	.840	.801	.835
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.830	.613	.693
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	293.448	230.026	364.609
Saturated model	.000	.000	.000
Independence model	1778.287	1637.499	1926.508

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	2.488	1.346	1.055	1.673
Saturated model	.000	.000	.000	.000
Independence model	9.533	8.157	7.511	8.837

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.074	.065	.082	.000
Independence model	.165	.158	.172	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	692.448	711.878		
Saturated model	648.000	731.938		
Independence model	2126.287	2132.504		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	3.176	2.885	3.503	3.265
Saturated model	2.972	2.972	2.972	3.358
Independence model	9.754	9.108	10.434	9.782

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	116	123
Independence model	36	38

Minimization: .042
Miscellaneous: .543
Bootstrap: .000
Total: .585

Result (Default model)

Minimum was achieved
Chi-square = 542.448
Degrees of freedom = 249
Probability level = .000

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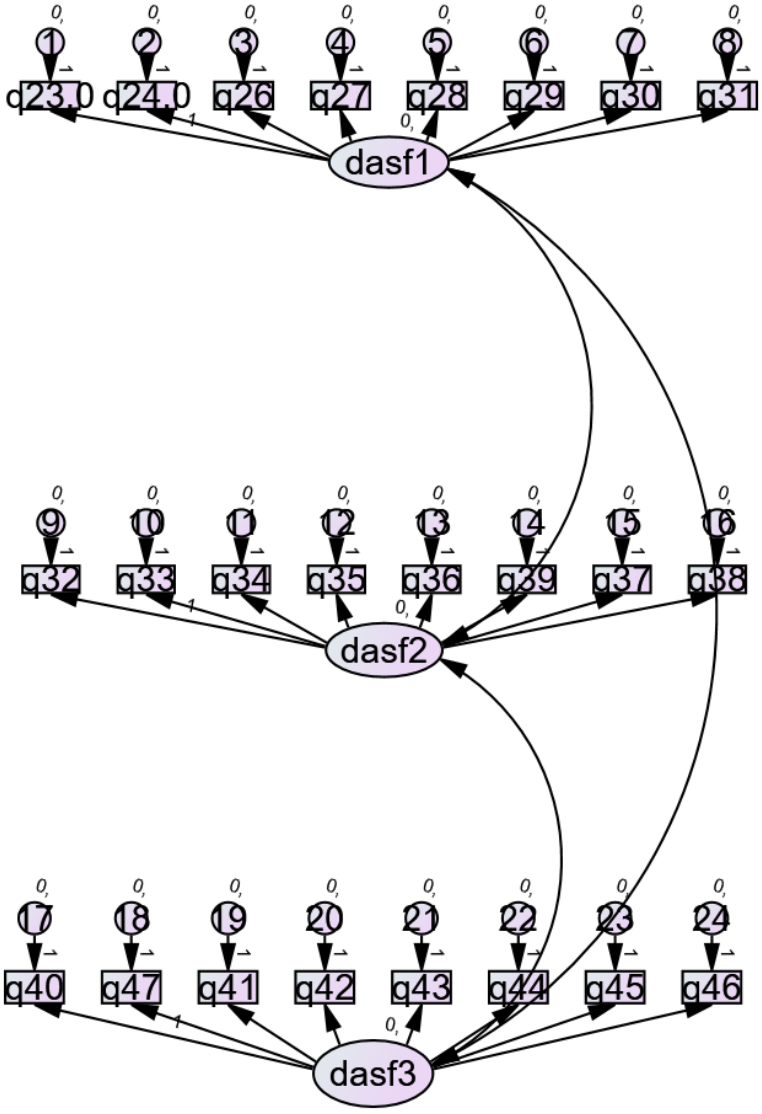

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CFA for MAQ

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	20	43.106	25	.014	1.724
Saturated model	45	.000	0		
Independence model	9	209.403	36	.000	5.817

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.121	.935	.883	.519
Saturated model	.000	1.000		
Independence model	.403	.725	.657	.580

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.794	.704	.902	.850	.896
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.694	.551	.622
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	18.106	3.715	40.348
Saturated model	.000	.000	.000
Independence model	173.403	131.589	222.729

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.337	.141	.029	.315
Saturated model	.000	.000	.000	.000
Independence model	1.636	1.355	1.028	1.740

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RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.075	.034	.112	.134
Independence model	.194	.169	.220	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	83.106	86.495	140.302	160.302
Saturated model	90.000	97.627	218.692	263.692
Independence model	227.403	228.928	253.141	262.141

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.649	.537	.823	.676
Saturated model	.703	.703	.703	.763
Independence model	1.777	1.450	2.162	1.789

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	112	132
Independence model	32	36

Result (Default model)

Minimum was achieved
Chi-square = 43.106
Degrees of freedom = 25
Probability level = .014

Appendices

Appendix 6

CFA for MAQ alternative

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	27	175.432	27	.000	6.497
Saturated model	54	.000	0		
Independence model	9	411.887	45	.000	9.153

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.574	.290	.614	.326	.595
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.600	.344	.357
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	148.432	110.257	194.107
Saturated model	.000	.000	.000
Independence model	366.887	305.661	435.580

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.805	.681	.506	.890
Saturated model	.000	.000	.000	.000
Independence model	1.889	1.683	1.402	1.998

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.159	.137	.182	.000
Independence model	.193	.177	.211	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	229.432	232.028		
Saturated model	108.000	113.192		
Independence model	429.887	430.753		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.052	.877	1.262	1.064
Saturated model	.495	.495	.495	.519
Independence model	1.972	1.691	2.287	1.976

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	50	59
Independence model	33	38

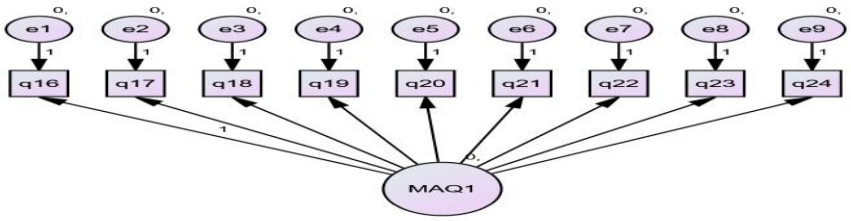
Minimization: .003
Miscellaneous: .244
Bootstrap: .000
Total: .247

Result (Default model)

Minimum was achieved
Chi-square = 175.432
Degrees of freedom = 27
Probability level = .000

Appendices

Appendix 6
Path diagram for MAQ



Appendix 6

CFA for Mastery

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	22	20.464	13	.084	1.574
Saturated model	35	.000	0		
Independence model	14	138.641	21	.000	6.602

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.852	.762	.941	.898	.937
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.619	.528	.580
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

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NCP

Model	NCP	LO 90	HI 90
Default model	7.464	.000	23.872
Saturated model	.000	.000	.000
Independence model	117.641	84.080	158.699

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.160	.058	.000	.186
Saturated model	.000	.000	.000	.000
Independence model	1.083	.919	.657	1.240

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.067	.000	.120	.275
Independence model	.209	.177	.243	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	64.464	67.398		
Saturated model	70.000	74.667		
Independence model	166.641	168.507		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.504	.445	.632	.527
Saturated model	.547	.547	.547	.583
Independence model	1.302	1.040	1.623	1.316

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	140	174
Independence model	31	36

Result (Default model)

Minimum was achieved
Chi-square = 20.464
Degrees of freedom = 13
Probability level = .084

Appendices

Appendix 6
Alternative CFA for Mastery

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	21	56.106	14	.000	4.008
Saturated model	35	.000	0		
Independence model	7	349.147	28	.000	12.470

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.839	.679	.874	.738	.869
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.500	.420	.434
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	42.106	22.726	69.048
Saturated model	.000	.000	.000
Independence model	321.147	264.600	385.144

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.257	.193	.104	.317
Saturated model	.000	.000	.000	.000
Independence model	1.602	1.473	1.214	1.767

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.117	.086	.150	.000
Independence model	.229	.208	.251	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	98.106	99.706		
Saturated model	70.000	72.667		
Independence model	363.147	363.681		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.450	.361	.574	.457
Saturated model	.321	.321	.321	.333
Independence model	1.666	1.406	1.959	1.668

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	93	114
Independence model	26	31

Minimization:	.001
Miscellaneous:	.242
Bootstrap:	.000
Total:	.243

Result (Default model)

Minimum was achieved
Chi-square = 56.106
Degrees of freedom = 14
Probability level = .000

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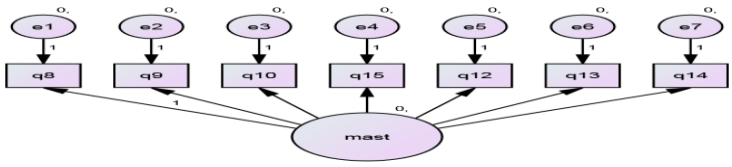
Path diagram for mastery



Appendix 6

CFA for Coping

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	54	171.889	81	.000	2.122
Saturated model	135	.000	0		
Independence model	15	821.474	120	.000	6.846

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.791	.690	.877	.808	.870
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.675	.534	.588
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

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NCP

Model	NCP	LO 90	HI 90
Default model	90.889	56.999	132.534
Saturated model	.000	.000	.000
Independence model	701.474	614.396	796.030

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.788	.417	.261	.608
Saturated model	.000	.000	.000	.000
Independence model	3.768	3.218	2.818	3.652

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.072	.057	.087	.010
Independence model	.164	.153	.174	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	279.889	288.443		
Saturated model	270.000	291.386		
Independence model	851.474	853.851		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.284	1.128	1.475	1.323
Saturated model	1.239	1.239	1.239	1.337
Independence model	3.906	3.506	4.340	3.917

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	131	144
Independence model	39	43

Minimization: .013
Miscellaneous: .411
Bootstrap: .000
Total: .424

Result (Default model)

Minimum was achieved
Chi-square = 171.889
Degrees of freedom = 81
Probability level = .000

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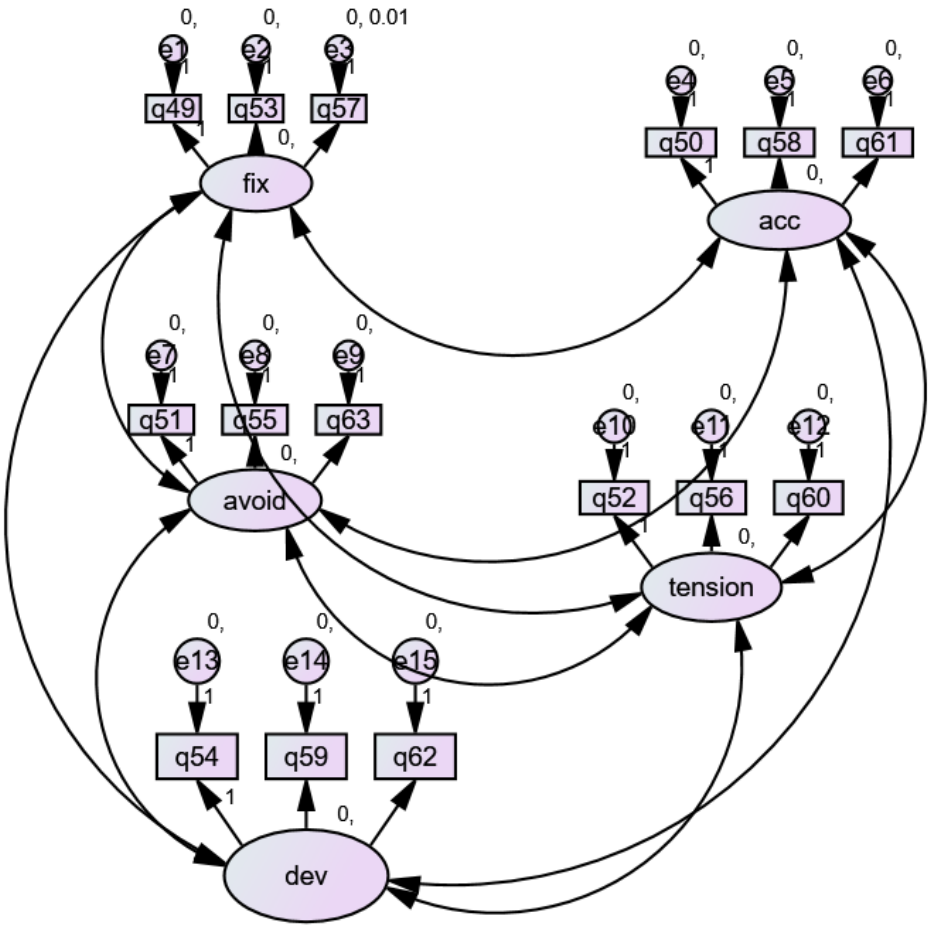

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Path diagram for coping
DAS and BDI

			Estimate	*S.E.*	*C.R.*	*P*	*β*
BDI total	<---	DAS total	.161	.044	3.644	***	.307

	Estimate	S.E.	C.R.	P	β
DAS total	82.969	1.501	55.283	***	.000
BDI total	-1.116	3.735	-.299	.765	.094

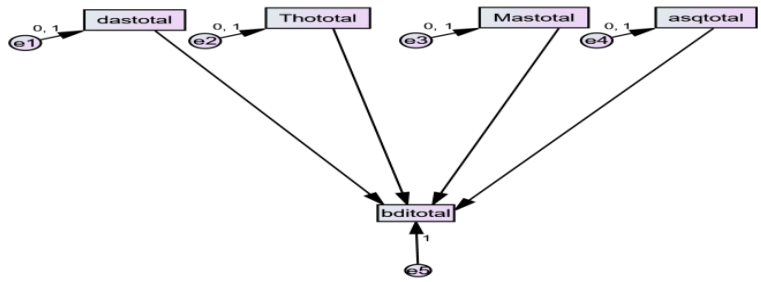
DAS, ASQ, MAQ and Mastery predicting BDI

			Estimate	S.E.	C.R.	P	β
BDI total	<---	DAS total	.071	.038	1.858	.063	.145
BDI total	<---	MAQ total	-.293	.104	-2.823	.005	-.220
BDI total	<---	Mastery total	-.926	.228	-4.068	***	-.317
BDI total	<---	ASQ total	.137	.047	2.900	.004	.226

	Estimate	S.E.	C.R.	P	β
Mastery total	21.287	.252	84.318	***	.000
MAQ total	39.504	.554	71.275	***	.000
DAS total	82.969	1.501	55.283	***	.000
ASQ total	77.132	1.212	63.638	***	.000
Coping total	26.981	8.008	3.369	***	.221

Path analysis of DAS total in prediction of BDI-II

	Chisq / df	TLI	CFI	RMSEA
DAS total factor	49.003/ 6	.184	-	.237



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DAS, ASQ, MAQ, Mastery and Coping predicting BDI

Regression Weights:

			Estimate	S.E.	C.R.	P	β
Coping total	<---	DAS total	.049	.039	1.247	.212	.107
Coping total	<---	MAQ total	.009	.106	.087	.931	.007
Coping total	<---	Mastery total	.341	.233	1.461	.144	.125
Coping total	<---	ASQ total	-.103	.049	-2.129	.033	-.182
BDI total	<---	DAS total	.078	.038	2.036	.042	.158
BDI total	<---	MAQ total	-.291	.103	-2.837	.005	-.219
BDI total	<---	Mastery total	-.880	.227	-3.873	***	-.302
BDI total	<---	ASQ total	.124	.048	2.587	.010	.203
BDI total	<---	Coping total	-.134	.085	-1.566	.117	-.125

	Estimate	S.E.	C.R.	P	Label
Mastery total	21.287	.252	84.318	***	.000
MAQ total	39.504	.554	71.275	***	.000
DAS total	82.969	1.501	55.283	***	.000
ASQ total	77.132	1.212	63.638	***	.000
Coping total	41.468	8.212	5.050	***	.060
BDI total	32.525	8.686	3.744	***	.236

DAS total, MAQ, ASQ, Mastery and coping predicting BDI-II.

	Chisq / df	TLI	CFI	RMSEA	AIC
DAS total factor	49.003/ 6	-.171	-	.237	91.003

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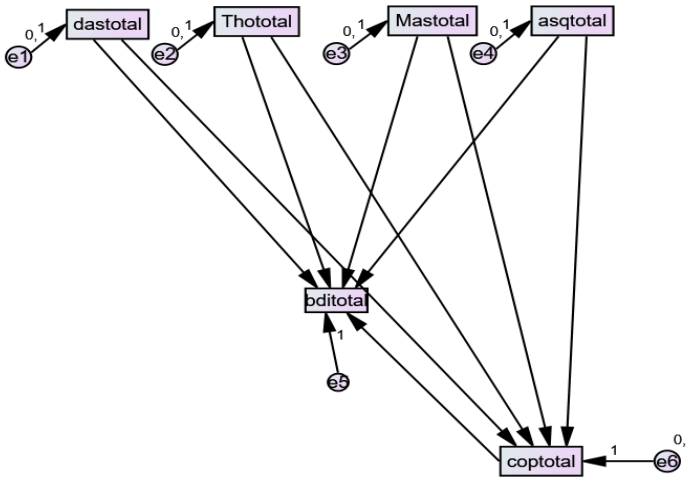

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CFA for Neuroticism

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	36	268.462	54	.000	4.972
Saturated model	90	.000	0		
Independence model	12	1201.011	78	.000	15.398

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.776	.677	.813	.724	.809
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.692	.538	.560
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	214.462	167.057	269.398
Saturated model	.000	.000	.000
Independence model	1123.011	1014.538	1238.897

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	1.231	.984	.766	1.236
Saturated model	.000	.000	.000	.000
Independence model	5.509	5.151	4.654	5.683

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.135	.119	.151	.000
Independence model	.257	.244	.270	.000

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AIC

Model	AIC	BCC	BIC	CAIC
Default model	340.462	345.028		
Saturated model	180.000	191.415		
Independence model	1225.011	1226.533		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.562	1.344	1.814	1.583
Saturated model	.826	.826	.826	.878
Independence model	5.619	5.122	6.151	5.626

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	59	66
Independence model	19	20

Minimization: .004
Miscellaneous: .279
Bootstrap: .000
Total: .283

Result (Default model)

Minimum was achieved
Chi-square = 268.462
Degrees of freedom = 54
Probability level = .000

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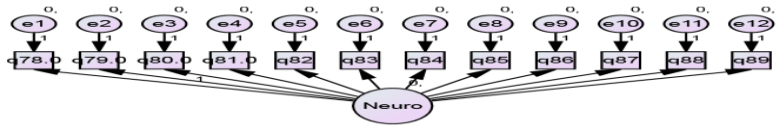

Appendix 6
CFA for GAD7

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	21	44.566	14	.000	3.183
Saturated model	35	.000	0		
Independence model	7	718.569	28	.000	25.663

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.938	.876	.957	.911	.956
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.500	.469	.478
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	30.566	14.085	54.653
Saturated model	.000	.000	.000
Independence model	690.569	606.913	781.635

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FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.204	.140	.065	.251
Saturated model	.000	.000	.000	.000
Independence model	3.296	3.168	2.784	3.585

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.100	.068	.134	.007
Independence model	.336	.315	.358	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	86.566	88.166		
Saturated model	70.000	72.667		
Independence model	732.569	733.102		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.397	.321	.508	.404
Saturated model	.321	.321	.321	.333
Independence model	3.360	2.977	3.778	3.363

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	116	143
Independence model	13	15

Minimization: .003
Miscellaneous: .219
Bootstrap: .000
Total: .222

Result (Default model)

Minimum was achieved
Chi-square = 44.566
Degrees of freedom = 14
Probability level = .000

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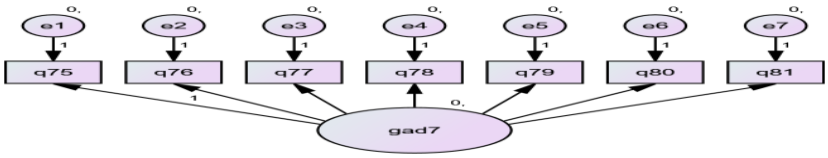

CFA for PHQ9

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	27	144.231	27	.000	5.342
Saturated model	54	.000	0		
Independence model	9	806.765	45	.000	17.928

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.821	.702	.850	.744	.846
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.600	.493	.508
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	117.231	83.310	158.675
Saturated model	.000	.000	.000
Independence model	761.765	673.311	857.641

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FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.662	.538	.382	.728
Saturated model	.000	.000	.000	.000
Independence model	3.701	3.494	3.089	3.934

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.141	.119	.164	.000
Independence model	.279	.262	.296	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	198.231	200.827		
Saturated model	108.000	113.192		
Independence model	824.765	825.630		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.909	.754	1.099	.921
Saturated model	.495	.495	.495	.519
Independence model	3.783	3.378	4.223	3.787

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	61	71
Independence model	17	19

Minimization: .003
Miscellaneous: .238
Bootstrap: .000
Total: .241

Result (Default model)

Minimum was achieved
Chi-square = 144.231
Degrees of freedom = 27
Probability level = .000

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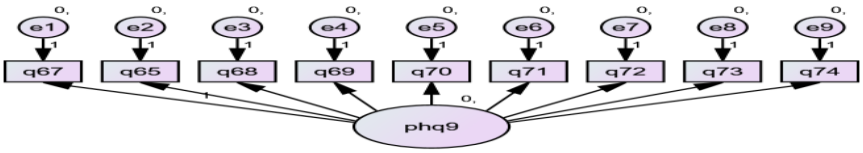

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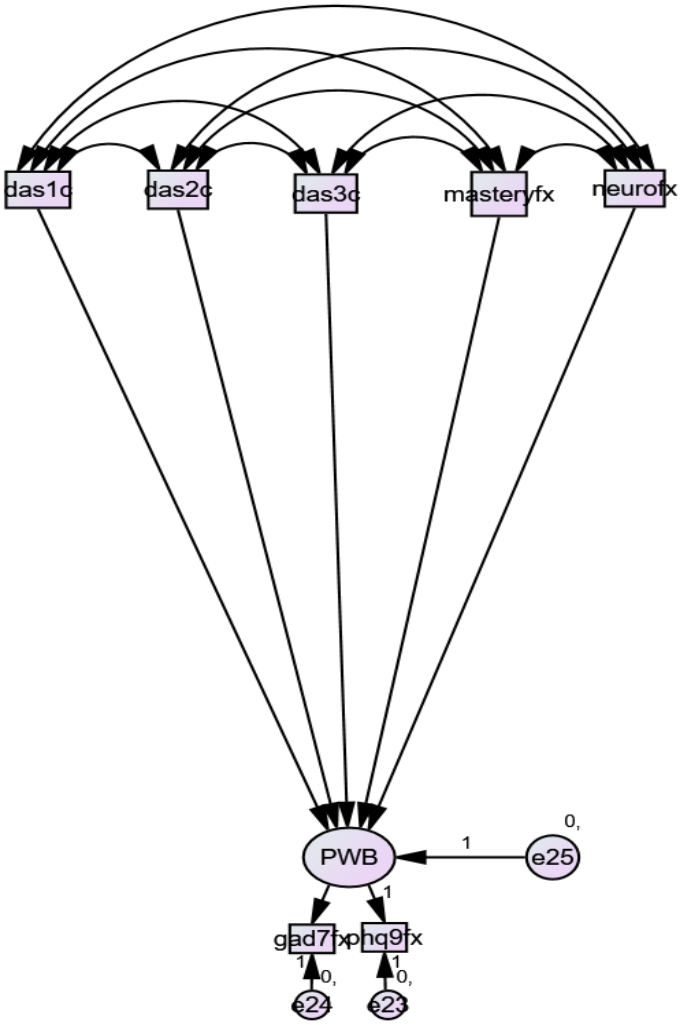
Appendix 7: path diagrams for measures utilised

Appendix 7
New model without mediators DAS, Mastery and Neuro



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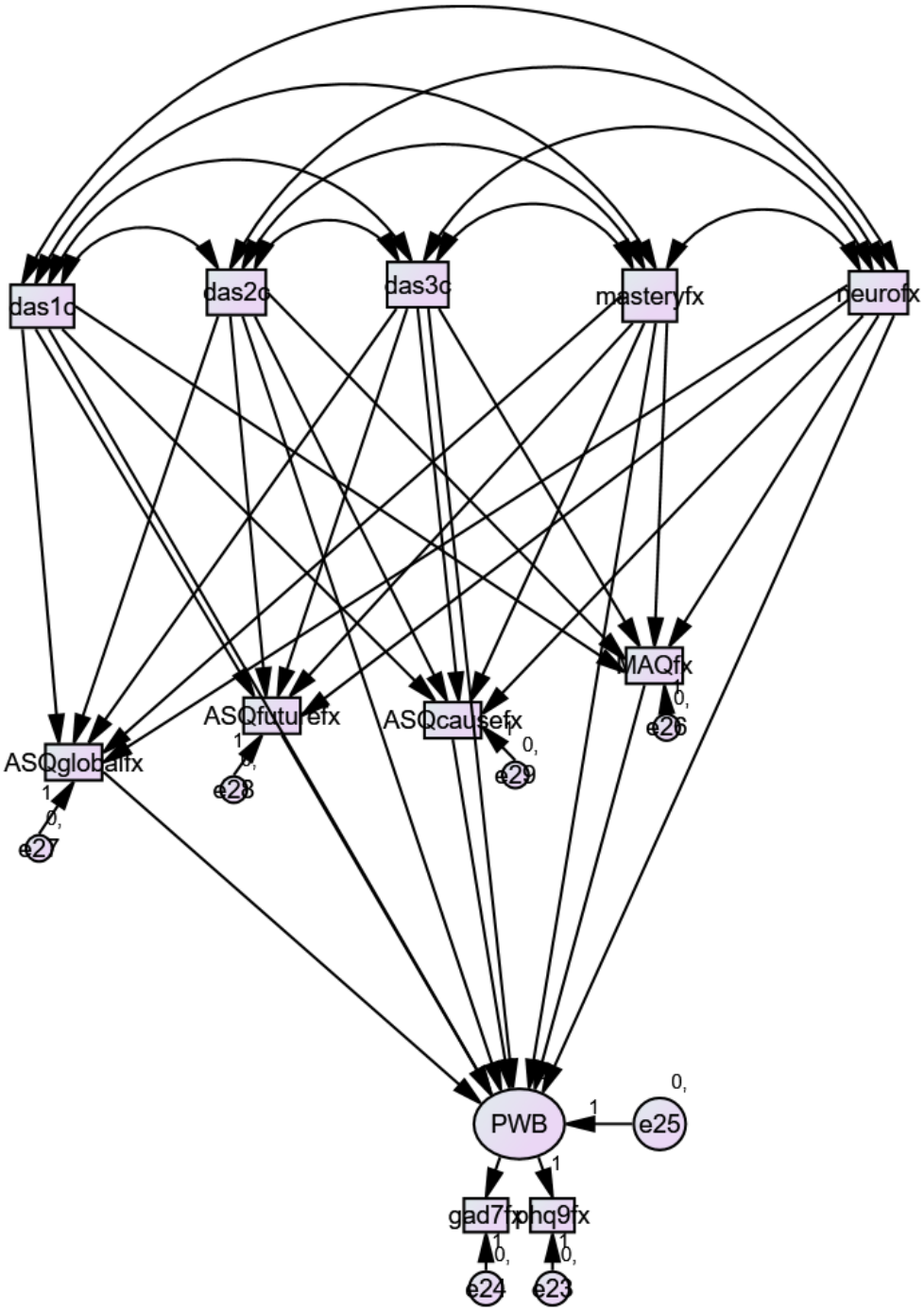
Appendices

New model with MAQ and ASQ with DAS Mast and Neuro direct effect



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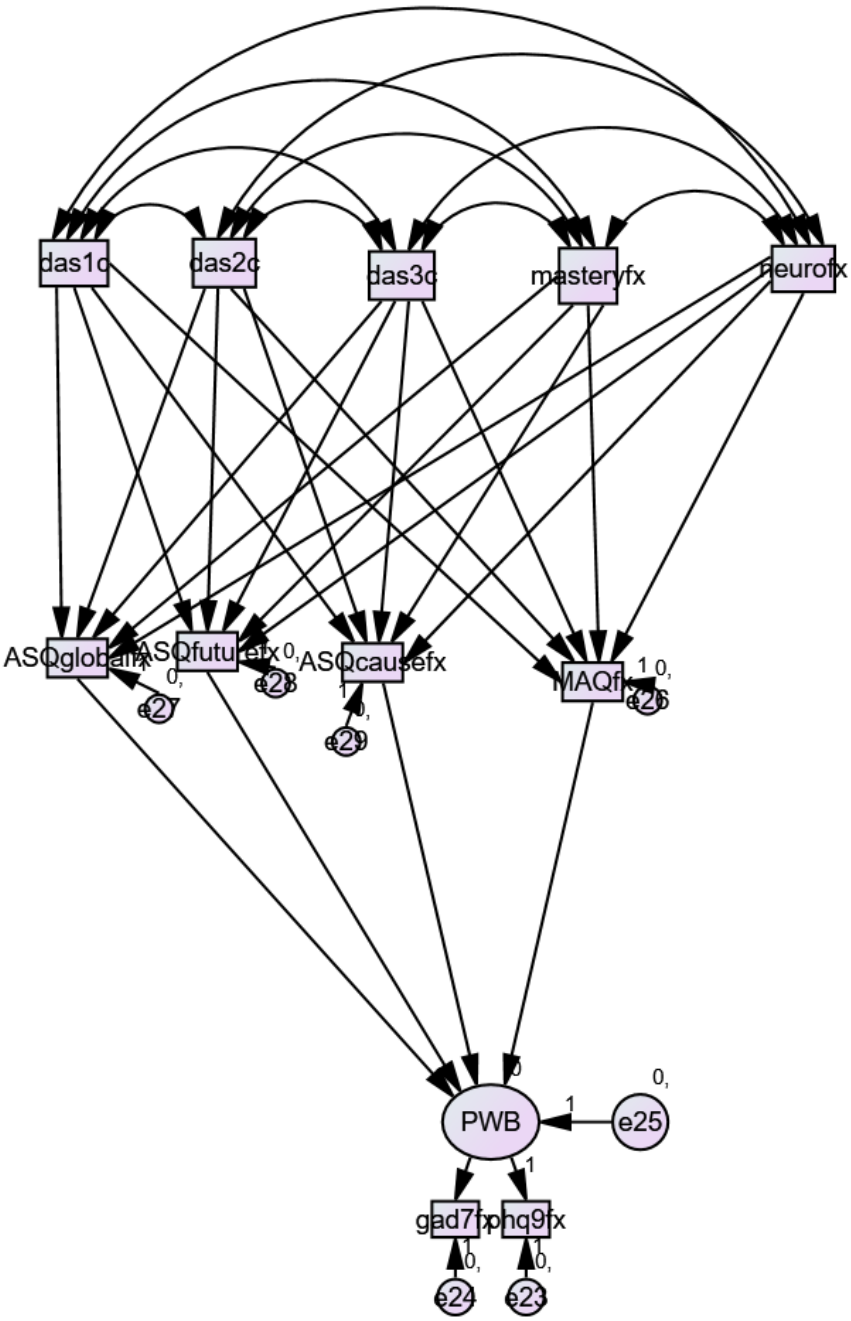
New model with MAQ and ASQ as mediators



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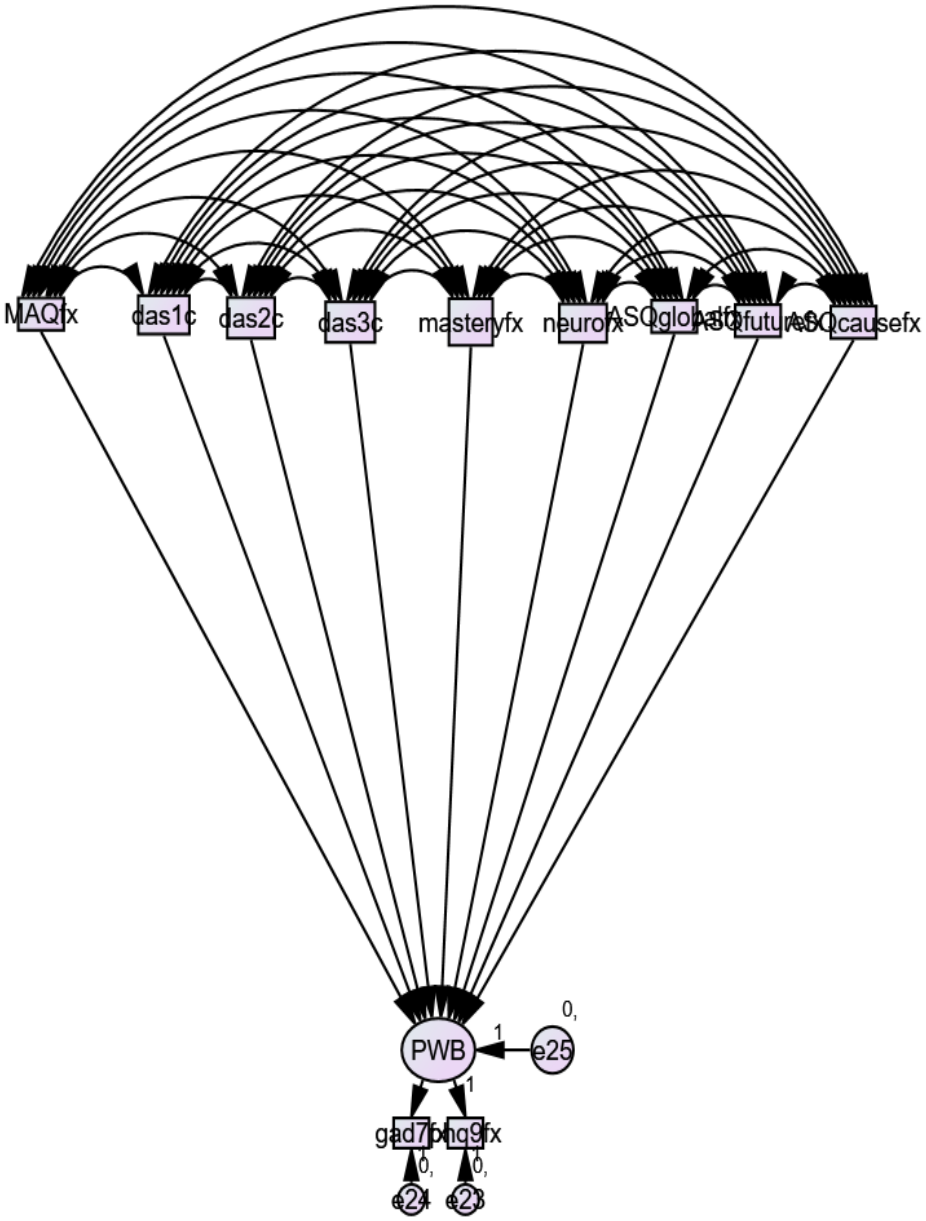
New model with all variables having direct effect



Appendix 7

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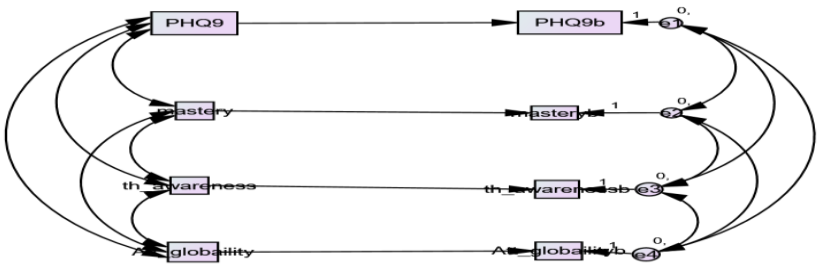
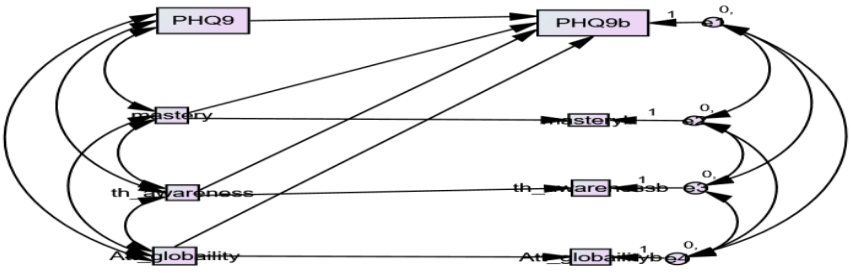
PHQ9 and GAD7 time 1&2
PHQ9 model 1



PHQ9 model 2



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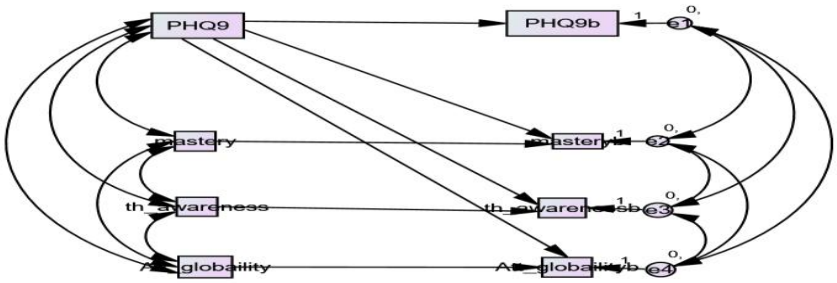
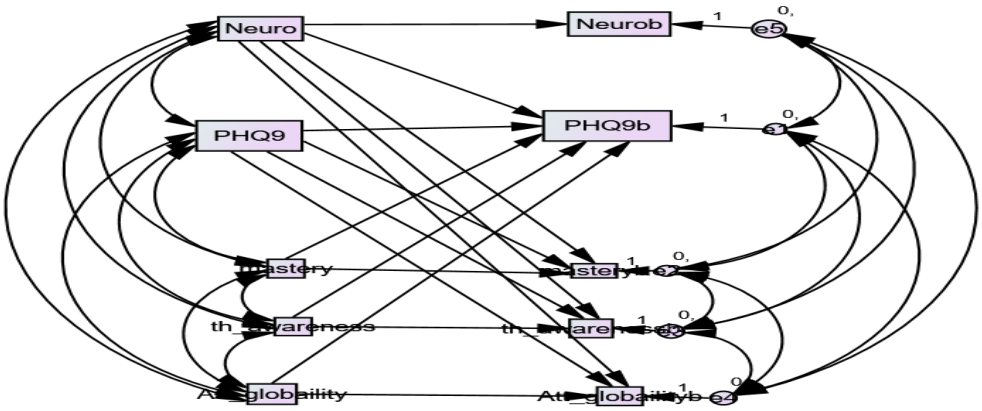
PHQ9 model 3



PHQ9 model 4 with Neuroticism



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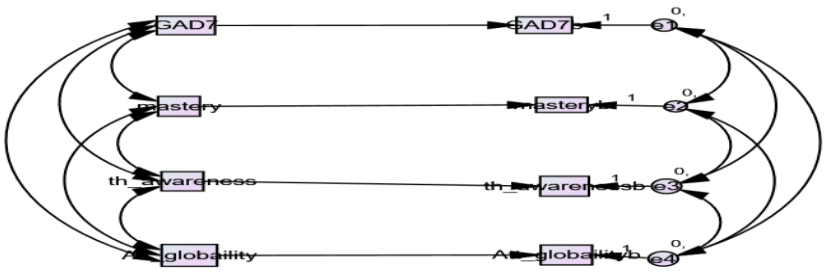
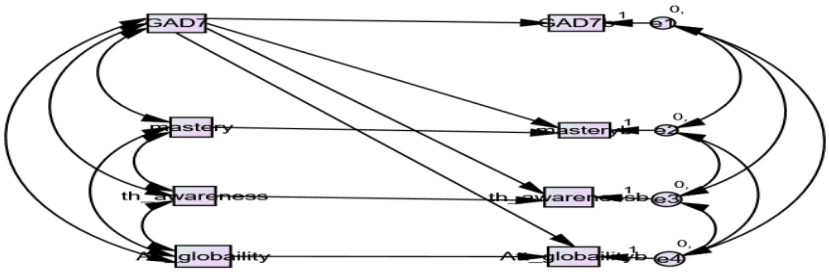
GAD7 model 1



GAD7 Model 2



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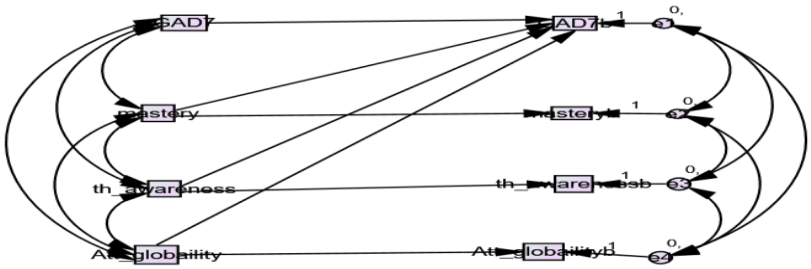
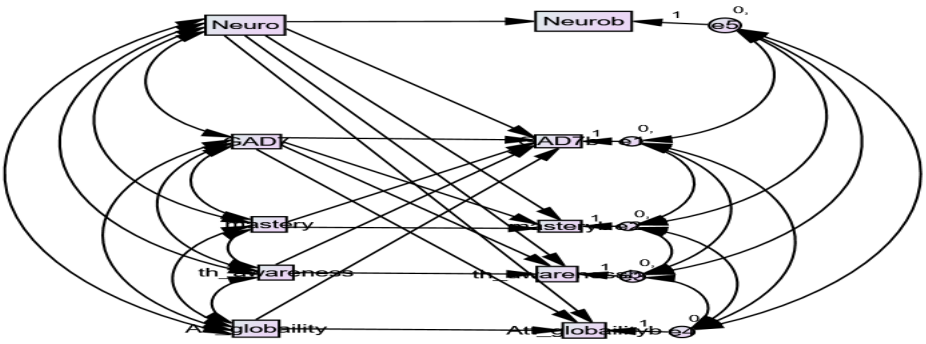
GAD7 model 3



GAD7 model 4 with Neuroticism



Appendices

Appendix 8: Hypothesised model and path analysis diagram for PHQ9 at time 2 with no coping

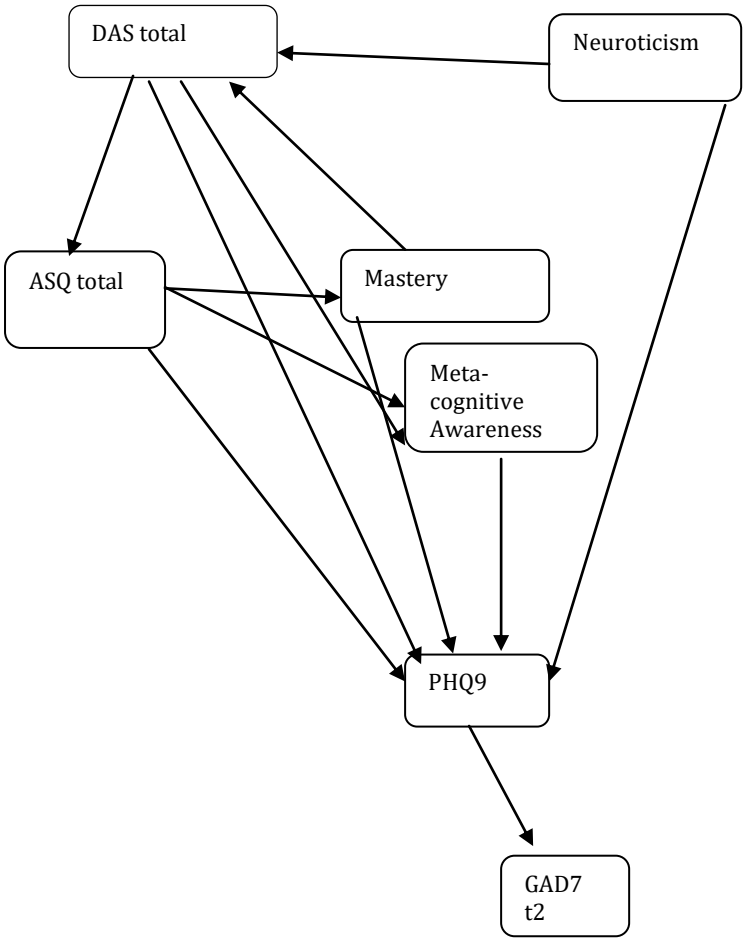


Figure 20 (A.1) Path coefficients for theoretical prediction of PHQ9 time 2 (t2) with no coping

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Appendix 9: Hypothesised model and path analysis diagram for GAD7 at time one and time two with no coping

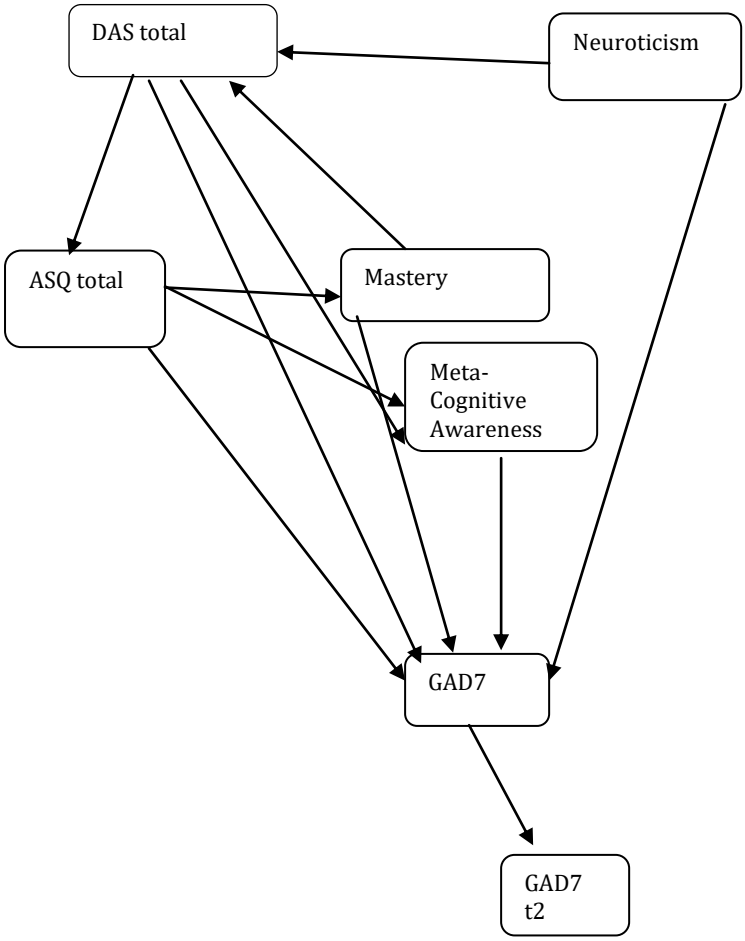

Figure 21 (A.2) Path analysis diagrams without coping for GAD7 at time 1 (t1), time 2 (t2) with no coping